



County Palatine of Chester.

REPORT
OF THE
MEDICAL OFFICER OF HEALTH
FOR THE YEAR 1910.

BY **MEREDITH YOUNG, M.D., D.P.H.,**

Of Lincoln's Inn, Barrister-at-Law.

PRESENTED TO THE
Public Health & Housing Committee
OF THE COUNTY COUNCIL,

July 14th, 1911.

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PHILLIPSON AND GOLDBER, PRINTERS, EASTGATE ROW AND FRODSHAM STREET.



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For the Year ending December 31st, 1910.

*To the Public Health and Housing Committee of the
County Council of the County Palatine of Chester
and to the Members of the County Council.*

PREFATORY NOTE.

CHESTER,

June 28th, 1911.

*To the Chairman and Members of the
Public Health and Housing Committee
of the Cheshire County Council.*

GENTLEMEN,

I have the honour of presenting to you my Report on the health and sanitary condition of the various districts in the Administrative County of Cheshire during the year 1910.

As revealed by the Preliminary Census Report, which came to hand whilst this volume was in the press, the population of the Administrative County has increased by 82,471 persons—a gain of 13.88 per cent. on the record of the census of 1901. This has been due in part to extensive strides made in certain favoured districts, but in chief to a steady and persistent maintenance of that normal increase of population characteristic of localities which are more than merely holding their own in the world's race of progress.

There are many statistical facts in this Report which may properly be made the subject of congratulation. The general death-rate during 1910 was 11.75 per thousand of the estimated population, the lowest rate on record, and close on 1.0 per thousand less than that recorded in 1909. The general death-rate in England and Wales during 1910 was 13.4 per thousand.

The zymotic death-rate, one of the most faithful indices of good general hygiene when based upon adequate data, exhibits a slight increase due almost entirely to the local prevalence of diphtheria in the Borough of Crewe. For many years this rate has been a low one despite local epidemic vagaries, such as that mentioned, and has moreover displayed a steady decline.

The infantile mortality again shews a pleasing reduction to 93 per thousand registered births, and reflects the result of painstaking endeavours on the part of many Local Health Authorities.

The death-rate from phthisis exhibits a still further fall, being only 0·71 per thousand of the estimated population. This rate is now about one-half of what it was in 1892, which is as far back as precise records are available. The decline in phthisis mortality has been an almost uninterrupted one since that date.

The birth-rate still shews a regrettable decline, which is all the more deplorable because it has persisted for so many years. One devoutly wishes that one could honestly accept the consolation so commonly offered by the so-called Neo-Malthusians, which is, roughly, to the effect that two children carefully brought up are better for the nation than half-a-dozen dragged up. This is of course a mere *petitio principii*: the limited family of one or two is not in general carefully brought up but is all too frequently spoiled and pampered whilst the largeish family which, it is alleged, is 'dragged up' in reality fights its way up and by fighting acquires the solid, and otherwise almost unattainable, property of self-maintenance. That the possibilities of this question are most serious every thoughtful and observant person can see if he wills to see: that the remedy chiefly lies in the inner consciousness of the people is obvious to all.

That the various Health Authorities in the Administrative County are alive to their responsibilities is well illustrated in the sections of this Report dealing with housing, water-supply, sewerage, sewage and refuse disposal and the like. But in a review of this kind it is impossible to avoid noticing the fact that certain Local Authorities are lagging behind in some matters—chiefly those like sewerage and sewage disposal, which are in one sense of the word unremunerative undertakings but which in a broad sense, as contributing directly to the health of the community, are excellent investments of public money. The question how

best to spur them on to better measures is always an exceedingly delicate one, and requires a large measure of patience and forbearance. To the credit of such Authorities however, I must say that any suggestions I have felt it my duty to make in the matter of sanitary improvement have been at all times received not merely with formal deference but with an earnest desire for emendation.

My thanks are due to your Committee for whole-hearted support of any proposals I have felt it necessary to make. I feel sure that your Committee realises that the matters which are formally brought before you do not represent a tithe of the work which is actually being accomplished in the County. The possibility of your being called in as a court of semi-final appeal undoubtedly acts as a powerful fulcrum to me in my advisory and critical capacity. The intimate co-operation which exists between the Local Government Board and County Councils renders the foundation a secure one for the taking of sound and comprehensive action, and one notices with the greatest gratification the tendency to make this co-operation closer still.

I am indebted to many persons for assistance cordially rendered to me in my duties, and amongst those to be primarily mentioned are the Medical Officers of Health and Inspectors of Nuisances of the various Sanitary Districts in the County: I have never had to ask in full or to ask twice for help and information in these quarters, and my thanks to them is therefore general and unqualified. To the Clerks and Surveyors of the various Councils, to my colleagues amongst the Officials of the County Council, and to numerous others with whom my official duties have brought me in contact, I can only offer a general though none the less sincere thanks for many courtesies and kindnesses.

I am,
 Mr. Chairman and Gentlemen,
 Your obedient Servant,
 MEREDITH YOUNG.

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Report of the Medical Officer of Health, For the year ended December 31st, 1910.

Section I.—AREA AND POPULATION.

Area.—The Area of the Administrative County of Chester is given in the Census Report of 1901 as 645,918 acres. Owing to the extension of the County Borough of Stockport in 1901 there were 1,738 acres lost to the Administrative County, leaving the area as 644,180 acres.

The principal changes in area have been due to the disappearance of the Stockport Rural District with a re-distribution of its component parts.

On November 9th, 1901, the Civil Parish and County Borough of Stockport was extended to include (1) part of the Civil Parish of Brinnington (Census population, 404) in Stockport Rural District, (2) part of the Civil Parish of Bredbury and Urban District of Bredbury and Romiley (Census population, 20), also (3) part of the Civil Parish of Cheadle and Urban District of Cheadle and Gatley (Census population, 2,904), and (4) part of the Civil Parish of Hazel Grove-cum-Bramhall and Urban District of Hazel Grove and Bramhall (Census population, 1,857).

On September 19th, 1902, Stockport Rural District was again reduced, the part of the Civil Parish of Brinnington (Census population, 98), yet belonging to Stockport Rural District, being transferred to Bredbury and Romiley Urban District.

All that remained in Stockport Rural District in 1903 was the Civil Parish of Handforth. This obtained urban powers as the Urban District of Handforth in September, 1904. The formation of this new Urban District further reduced the population of the Rural Districts by 911.

The area absorbed by the County Borough of Stockport was:—

From Stockport Rural District	...	...	196 acres.
From Bredbury and Romiley Urban District	...	192	„
From Chcadle and Gatley Urban District	...	726	„
From Hazel Grove and Bramhall Urban District	...	624	„
Total	...	...	<u>1738</u> „

On April 1st, 1902, the Civil Parish of Compstall (Census population, 875) ceased to belong to Stockport Rural District and became an Urban District. On the same day the Civil Parish of Whitby (Census population, 4,082) ceased to belong to Wirral Rural District and became Ellesmere Port and Whitby Urban District.

In November, 1910, the Urban District of Wallasey was created a Municipal Borough, but as it was an Urban District for 10 months of the year it has been deemed proper to retain it as such for the purposes of this Report.

The changes named affected the relative proportion of Urban and Rural areas, so that the net result now stands as follows:—

6 Municipal Boroughs	...	15,587 acres.
36 other Urban Districts	..	78,456 „
12 Rural Districts	...	546,788 „
Total	...	<u>644,180</u> „

Population.—The changes described above affected the population in a similar manner. At the Census of 1901 the population of the Administrative County was enumerated as 599,070. The extension of the County Borough of Stockport resulted in a loss to the County of 5,185 persons as follows:—

From Stockport Rural District	...	...	404 persons.
From Bredbury and Romiley Urban District	...	20	„
From Cheadle and Gatley Urban District	...	2904	„
From Hazel Grove and Bramhall Urban District	...	1857	„
Total	...	...	<u>5185</u> „

On April 1st, 1902, the Civil Parish of Whitby (Census population, 4,082), ceased to belong to the Wirral Rural District and became the Urban District of Ellesmere Port and Whitby.

These changes altered the relative proportion of Urban and Rural population, so that estimated to the middle of the year 1910, it is as under:—

6 Municipal Boroughs	...	178,124 persons.
36 other Urban Districts	...	320,613 „
12 Rural Districts	...	177,477 „
Total	...	676,214 „

The following Tabular Statement shewing the fluctuations of population in the various districts in the Administrative County as gauged by the two last Census enumerations, is reproduced from previous Reports:—

Municipal Boroughs.	Population Enumerated, 1901.	Increase or Decrease of Population between 1891 and 1901.		Percentage of Increase or Decrease between 1891 and 1901.	
		Increase	D'crease	Increase	D'crease
Congleton	10707	...	37	...	0.34
Crewe	42074	9300	...	28.37	...
Dukinfield	18929	1544	...	8.88	...
Hyde	32766	2096	...	6.83	...
Macclesfield	34624	...	1385	...	3.84
Stalybridge	27673	890	...	3.32	...
6 Municipal Boroughs	166773	12408	...	8.03	...

Other Urban Districts.	Population Enumer- ated, 1901.	Increase or Decrease of Population between 1891 and 1901.		Percentage of Increase or Decrease between 1891 and 1901.	
		Increase	D'crease	Increase	D'crease
Alderley Edge ...	2856	575	...	25.20	...
Alsager ...	2597	685	...	34.82	...
Altrincham ...	16831	4391	...	35.29	...
Ashton-upon-Mersey	5563	1329	...	31.38	...
Higher Bebington ...	1540	119	...	8.37	...
Lower Bebington ...	8398	3182	..	61.00	...
Bollington ...	5245	...	90	...	1.68
Bowdon ...	2788	...	4	.	0.14
Bredbury and Romiley	7185	1286	...	22.09	...
Bromborough ...	1891	151	...	8.67	...
Buglawton ...	1452	70	...	5.06	...
Cheadle and Gatley ...	7916	2568	...	31.12	...
Compstall...	875	...	...	..	...
Ellesmere Port and Whitby ...	4082	...	...	...	...
Hale ...	4562	1987	...	77.16	...
Handforth ...	911	...	...	...	...
Hazel Grove & Bramhall	7934	1923	...	24.44	...
Hollingworth ...	2447	...	448	...	15.47
Hoole ...	5341	1449	...	37.23	...
Hoylake & West Kirby	10911	4366	...	66.70	...
Knutsford ...	5172	529	...	11.39	...
Lymm ..	4707	...	288	...	5.76
Marple ...	5595	751	...	15.50	...
Middlewich ...	4609	699	..	17.60	...
Mottram ...	3128	..	142	...	4.34
Nantwich ..	7722	310	...	4.18	...
Neston and Parkgate ...	4154	577	...	16.13	...
Northwich ...	17611	2697	...	18.08	...
Runcorn ...	16491	...	3559	...	17.75
Sale ...	12088	2444	...	25.86	...
Sandbach ...	5558	...	266	...	4.57
Tarporley ...	2644	...	58	...	2.14
Wallasey ...	53579	20350	...	61.24	...
Wilmslow ...	7361	1017	...	16.03	...
Winsford ...	10382	...	58	...	0.55
Yeardsley-eum-Whaley	1487	252	...	20.40	...
36 other Urban Districts	263673	48794	...	22.83	...

Rural Districts.	Population Enumerated 1901.	Increase or Decrease of Population between 1891 and 1901.		Percentage of Increase or Decrease between 1891 and 1901.	
		Increase	D'crease	Increase	D'crease
Bucklow	19890	2097	...	11.78	...
Chester	10989	165	...	1.52	...
Congleton	12220	...	285	...	2.33
Disley	2827	567	...	25.08	...
Macclesfield	15775	...	121	...	0.76
Malpas	4488	...	136	...	2.93
Nantwich	23197	285	...	1.24	...
Northwich	22073	1119	...	5.34	...
Runcorn	23244	...	674	...	2.81
Tarvin	12614	...	89	..	0.70
Tintwistle	2105	...	471	...	18.24
Wirral	14017	...	530	...	2.84
12 Rural Districts ...	163439	1924	...	1.17	...

In all cases of change of area between 1891 and 1901, the enumerated population in 1901 is compared with the enumerated population of the new area in 1891.

The estimated populations for 1910 for the whole of the districts in the Administrative County are shewn in Table I. in the Appendix to this Report. Whilst all such estimates are made with the greatest accuracy possible, the further one gets from the actual census enumeration the greater becomes the liability to error. The need for a more frequent census is not quite so apparent in a County as it is in the very large towns, but at the same time the fact that such a thing is desirable even in County areas is apparent from the results of special census enumerations which have been from time to time made in various districts in this County.

Density of Population.—This is shewn in the first Table of Statistics given at the end of this Volume. In the 6 Municipal Boroughs it averages 11.30 persons per acre, in the 36 other Urban Districts 3.99 persons per acre, and in the 12 Rural Districts 0.32 persons per acre. Taking the Administrative County as a whole it averages 1.06 persons per acre.

The variation is of course considerable in different parts of the County. In Altrincham Urban District it is highest, namely, 28.45 persons per acre, and this figure is closely followed by Crewe Municipal Borough (22.62), Wallasey Urban District (22.39), and Hoole Urban District (18.9). The lowest figures for density of population are found in Tintwistle Rural District (0.17), Malpas Rural District (0.20), Macclesfield Rural District (0.21), and Tarvin Rural District (0.22), whilst several of the other Rural Districts shew figures only very slightly higher.

Tenements.—The proportion of tenements with less than 5 rooms, which averaged 41.0 per cent. of total tenements in the entire Administrative County at the Census of 1901, shewed considerable variations in the larger Urban Districts. The proportion then ranged from 15.0 per cent. in Crewe, and 19.7 per cent. in Wallasey, to 68.6 per cent. in Stalybridge and 71.6 per cent. in Hyde.

Census 1911—Preliminary Figures.—The Preliminary Report of the 1911 Census issued as this Report is in the printer's hands shows the following figures for the Administrative County:—

Area in Statute Acres (Land and Inland Water).	Families or Separate Families.	Persons.	Males.
644172 ...	150749 ...	676356 ...	321806
1901.			
Females.	Persons.	Increase.	
354550 ...	593885 ...	82471	

The figures for the various Districts are as under:—

Municipal Boroughs. (7)	Population.		Increase or Decrease of Population in Intercensal Period.		Families or Separate Occupiers, 1911.
	1901.	1911.	Increase.	Decrease.	
Congleton ...	10707	11310	603	—	2665
Crewe ...	42074	44970	2896	—	9955
Dukinfield ...	18929	19426	497	—	4626
Hyde ...	32766	33444	678	—	8019
Macclesfield ...	34624	34804	180	—	8436
Wallasey ...	53579	78514	24935	—	16921
Stalybridge ...	27673	26514	—	1159	6399

Urban Districts. (35)	Population.		Increase or Decrease of Population in Intercensal Period.		Families or Separate Occupiers,
	1901.	1911.	Increase.	Decrease.	1911.
Alderley Edge ...	2891	3143	252	—	701
Alsager ...	2597	2743	146	—	640
Altrincham ...	16831	17816	985	—	4107
Ashton-upon-Mersey ...	5563	7236	1673	—	1746
Bollington ...	5245	5225	—	20	1212
Bowdon ...	2788	3044	256	—	665
Bredbury and Romiley	7185	8684	1499	—	2115
Bromborough ...	1891	1974	83	—	403
Buglawton ...	1452	1439	—	13	337
Cheadle and Gatley ...	7916	9914	1998	—	2199
Compstall ...	875	908	33	—	223
Ellesmere Port and Whitby ...	4275	10366	6091	—	1963
Hale ...	4562	8351	3789	—	1945
Handforth ...	911	935	24	—	211
Hazel Grove & Bramhall	7934	9634	1700	—	2268
Higher Bebington ...	1540	1689	149	—	353
Hollingworth ...	2447	2581	134	—	634
Hoole ...	5341	5929	588	—	1224
Hoylake & West Kirby	10911	14029	3118	—	2890
Knutsford ...	5172	5760	588	—	1135
Lower Bebington ...	8398	11412	3014	—	2300
Lymm ...	4707	4989	282	—	1177
Marple ...	5595	6484	889	—	1590
Middlewich ...	4669	4910	241	—	1094
Mottram in Longdendale	3128	3049	—	79	756
Nantwich ...	7722	7816	94	—	1691
Neston and Parkgate ...	4154	4596	442	—	935
Northwich ...	17611	18151	540	—	3831
Runcorn ...	16491	17354	863	—	3767
Sale ...	12088	15046	2958	—	3563
Sandbach ...	5558	5723	165	—	1340
Tarporley ...	2644	2604	—	40	598
Wilmslow ...	7361	8153	792	—	1947
Winsford ...	10382	10772	390	—	2372
Yeardsley-cum-Whaley	1487	1659	172	—	390

Rural Districts. (12)	Population.		Increase or Decrease of Population in Intercensal Period.		Families or Separate Occupiers,
	1901.	1911.	Increase.	Decrease.	1911.
Bucklow	19890	22870	2980	—	4959
Chester	10908	12448	1540	—	2381
Congleton	12220	12825	605	—	2755
Disley	2827	2958	131	—	716
Macclesfield	15740	16629	889	—	3659
Malpas	4488	4643	155	—	1030
Nantwich	23197	24992	1795	—	5458
Northwich	22073	23271	1198	—	4983
Runcorn	23244	28216	4972	—	6211
Tarvin	12614	13187	573	—	2867
Tintwistle	2105	2193	88	—	551
Wirral	13905	19024	5119	—	3836

Wallasey Borough shows the largest increase, no less than 24,935; then in order come Ellesmere Port and Whitby, 6,091; Wirral Rural, 5,119; Runcorn Rural, 4,972; Hale Urban, 3,789; Hoylake and West Kirby, 3,118; Lower Bebington, 3,014; Bucklow Rural, 2,980; and Sale Urban, 2,958.

The important part played by the Wirral Peninsula in the total County increase will readily be seen. Wallasey is sixth in the list of 98 towns, the intercensal increase being 46.5 per cent.

The only serious decrease is in the Borough of Stalybridge, where the population is 1,159 less than in 1901. The other decreases are Mottram (79), Tarporley (40), Bollington (20), and Buglawton (13).

The total population of the Administrative County, inclusive of the 3 County Boroughs (Birkenhead, Chester and Stockport) is 954,919, showing an increase of 14.2 per cent. in the intercensal period. This figure places Cheshire 13th in the list of Counties.

SECTION II.—Births and Deaths.

Births.—There were 15,273 births registered in the Administrative County during 1910, namely, 3,922 in the 6 Municipal Boroughs, 7,476 in the 36 other Urban Districts, and 3,875 in the 12 Rural Districts.

The birth-rate per thousand living in the Administrative County was therefore, 22.30 for the year 1910. In the whole of England and Wales this rate was 24.8 per thousand living, in the Rural Districts of England and Wales 25.0, in the 77 great towns 25.0, and in the 136 smaller towns 23.7. In Cheshire the birth-rate varied from 22.0 in the six Municipal Boroughs to 22.9 in the 36 other Urban Districts, and 22.3 in the 12 Rural Districts. Ellesmere Port and Whitby Urban District shewed an exceptionally higher rate of 42.4, and the rate varied in other parts of the County from 29.08 in Neston and Parkgate Urban District, and 28.06 in Runcorn Urban District, down to 8.6 in Bowdon Urban District, 15.7 in Compstall Urban District, 15.87 in Macclesfield Rural District, and 16.2 in Mottram Urban District.

Speaking generally, the birth-rates were again lower in the better-class residential districts than in the poorer-class districts and in the working parts of manufacturing towns. The following may be taken as examples:—

Better-class Districts.			Birth-Rate.
Alderley Edge	...	...	16.3
Bowdon	...	...	8.6
Hale	...	...	18.14
Hoyle and West Kirby	...	...	17.0
Working-class Districts.			
Ellesmere Port and Whitby U.D.	...	...	42.4
Congleton M.B.	...	...	28.4
Runcorn U.D.	...	...	28.6
Winsford U.D.	...	...	26.7
Sandbach U.D.	...	...	25.4
Northwich R.D.	...	...	25.4
Crewe Borough	...	...	23.0

This state of things is not confined to Cheshire, but is reflected in the vital statistics of virtually every district in the Kingdom and of most countries to which civilization has

penetrated. During the last twenty-five years the birth-rate of eleven European countries has fallen from an average of 33.7 per thousand of the population to an average of 30 per thousand. This decline in the birth-rate has been greatest in England, Germany, Italy, Austria and Hungary, and least in Ireland, Norway and Sweden.

In England and Wales the decline is apparent from the following figures:—

			Birth-Rate per 1,000.
1881-1885	...	...	33.5
1886-1890	...	...	31.4
1891-1895	...	...	30.5
1896-1900	...	...	29.3
1901-1905	...	...	28.1
1906 ..	...	...	27.1
1907 ..	...	...	26.3
1908 ..	...	...	26.5
1909 ..	...	...	25.6
1910 ..	...	...	24.8

There is no evading the fact that this decline is due to the deliberate restriction of child-bearing and that this unnatural and unphysiological procedure is most prevalent in the middle-class section of the population. It is probably futile to endeavour to counteract this tendency. But its existence renders it all the more imperative that unsparing efforts should be made on all sides to limit infantile mortality. If the increase of the nation is to be cut down in this direction the expenditure must also be rigorously reduced lest racial bankruptcy fall upon us.

Deaths.—The total number of deaths during 1910 in the Administrative County numbered 8,050, namely, 2,508 in the 6 Municipal Boroughs, 3,690 in the 36 other Urban Districts, and 1,852 in the 12 Rural Districts. The death-rate for the County, as a whole, was 11.75 per thousand living. The comparative figures for the rest of the country were:—

England and Wales	...	...	13.4
77 Great Towns	...	...	14.3
136 Smaller Towns	...	...	12.4
Rural Districts	...	...	12.8

In the 6 Municipal Boroughs of Cheshire taken together the death-rate was 14.06, in the 36 other Urban Districts 11.28, and in the 12 Rural Districts 11.75.

GENERAL DEATH-RATE (ALL CAUSES) & ZYMOTIC DEATH-RATE IN CHESHIRE 1901-1910.

GENERAL DEATH-RATE  ZYMOTIC DEATH RATE 



The death-rates vary considerably in the different districts. The highest rates are recorded in the following districts:—

Tarporley U.D.	...	...	16.9
Buglawton U.D.	...	...	16.5
Stalybridge M.B.	...	...	15.65
Compstall U.D.	...	...	15.7
and Congleton M.B.	...	...	15.4

The lowest rates are recorded in the following districts:—

Handforth U.D.	...	...	6.3
Bromborough U.D.	...	...	6.6
Hale U.D.	...	...	6.9
Yeardsley-cum-Whaley U.D.	...	...	7.3
Alderley Edge U.D.	...	...	7.5
Macclesfield R.D.	...	...	8.7
Disley R.D.	...	...	9.1
Tintwistle R.D.	...	...	9.5
Bucklow R.D.	...	...	9.7
Wirral R.D.	...	...	9.8
and Chester R.D.	...	...	9.9

The death-rate for the Administrative County in 1910 affords some reason for congratulation, as a glance at the death-rates for the previous ten years will show.

DEATH-RATES PER 1,000 LIVING.

Year.		Cheshire.		England and Wales.
1910	...	11.75	...	13.4
1909	...	12.7	...	14.5
1908	...	13.1	...	14.7
1907	...	13.6	...	15.0
1906	...	13.7	...	15.4
1905	...	13.8	...	15.2
1904	...	15.7	...	16.2
1903	...	14.1	...	15.4
1902	...	14.6	...	16.2
1901	...	15.6	...	16.9

This low death-rate is due to a gain on the profit and loss account so to speak of the factors concerned in the production of a death-rate. The zymotic death-rate shews an increase

on the immediately previous year, being 0.77 per thousand of the population, as compared with 0.66 in 1909. The infantile mortality rate however, fell from 99.3 per thousand births registered in 1909 to 93.0 in 1910, the principal decrease taking place in the Urban Districts. Respiratory diseases caused fewer deaths during 1910, as also did influenza, pulmonary phthisis, and other tubercular diseases. Whooping-cough was increasingly prevalent during 1910, and caused about 3 times as many deaths as during 1909. It is pleasing to note a diminution in the deaths from the more serious groups of disease, and particularly in those due to tuberculosis.

Compared with those registration counties with populations exceeding 100,000 persons Cheshire stands out favourably as shewn in the following statement:—

Registration Counties.	Highest Rates per 1,000 living.	Registration Counties.	Lowest Rates per 1,000 living.
Carmarthenshire	17.5	Middlesex ...	10.2
Denbighshire	16.0	Essex ...	10.5
Yorks. N. Riding	15.4	Northamptonshire	11.1
Monmouthshire	15.4	Kent ...	11.3
Cumberland	15.2	Leicestershire ...	11.5
Glamorganshire	15.1	Berkshire ...	11.6
Lancashire	15.0	Buckinghamshire	11.6
		Cheshire ...	11.75

Infantile Mortality.—The Local Government Board in their Memorandum on the preparation of Annual Reports by Medical Officers of Health, lay special stress on certain information which they desire should be given in the section relating to infantile mortality. Certain paragraphs from this Memorandum are quoted, and I have italicised some of those paragraphs as relating to matters which have not, in my opinion, received adequate comment in many of the Reports with which I have been furnished. It is not possible, in the absence of such information, for such a complete statement of this highly important question to be presented for the County as a whole as one would wish to give and one trusts that the little labour necessary will not be grudged in the future Reports of Medical Officers of Health.

“This section of the report should treat of each disease in turn; and it will be convenient in the same connection to

describe the administrative action taken. Thus the administration of the Midwives Act may with advantage be considered in relation to puerperal fever and of the Notification of Births Act, 1907, in relation to infant mortality.

“If the last named Act has been adopted, the Medical Officer of Health should report fully in his annual report on the measures taken by assistance of the Act in repression of infant mortality, and on the observed effect of such measures.

“Table V. issued by the Board affords opportunity for record in detail of facts as to infant mortality. It is well known that in many parts of this country the infantile death-rate remains unduly high; that it differs widely in districts the circumstances of which are not definitely dissimilar; and that within the limits of a given sanitary area this death-rate may exhibit striking diversities. Not a few Medical Officers of Health, in their annual reports—more particularly in reports of recent years—have dealt in detail with this subject, thus making important contributions to a better understanding of the conditions which conduce to infant mortality. Nevertheless, statistics available in this connection do not afford, except in a broad and general way, satisfactory basis for comparison of district with district, nor, indeed, always for useful contrast of different sections of the same district.

“In the text of his annual report, the Medical Officer of Health will, no doubt, comment on the facts that he has recorded in his table or tables, offering, at the same time, observations on the conditions which, in his view, have mainly contributed to any special infant mortalities witnessed, and giving account of any measures adopted to ameliorate those conditions regarded by him as especially hostile to infant life. In so far as modification of procedure for the purpose, or of law in facilitating such modification, is in his opinion necessary, the Medical Officer of Health is invited to state his views.”

“It is not proposed that report on the above lines be limited to districts exhibiting unduly high infantile death-rates. Data are desirable respecting districts low in the scale of infant mortality, with comment by the Medical Officer of Health on the facts that he is recording, and indication of the conditions which, in his view, have principally conduced in his district to comparatively insignificant infantile death-rate.”

Taking the Administrative County as a whole, the deaths of infants under one year of age numbered 1,430, equal to a

rate per thousand registered births of 93.0. In England and Wales the comparative figure was 106, in the 77 great towns 115, in the 136 smaller towns 104, and in the Rural Districts 96. The figure for the Administrative County of Cheshire is thus a distinctly favourable one. But there are lights and shades in the picture, as may be seen from the fact that in the six Municipal Boroughs of Cheshire the rates recorded averaged 128, as compared with 86 in the 36 other Urban Districts, and 72 in the 12 Rural Districts.

In the following districts infantile mortality ruled high:—

Compstall U.D.	...	...	285
Dukinfield M.B.	...	...	163
Nantwich U.D.	...	...	150
Hyde M.B.	...	...	141
Runcorn U.D.	...	...	139
Congleton M.B.	...	..	118
Tarporley U.D.	...	...	113
Northwich U.D.	...	...	112

In the undermentioned districts the rates have been very low ones:—

Handforth U.D.	...	...	Nil
Wilmslow U.D.	..	...	23
Higher Bebington U.D.	...	...	25
Disley R.D.	...	...	27
Yeardsley-cum-Whaley U.D.	...	...	37
Marple U.D.	...	...	40
Bollington U.D.	...	...	40
Middlewich U.D.	...	...	44
Neston and Parkgate U.D.	...	...	44
Hazel Grove and Bramhall U.D.	..	...	46
Cheadle and Gatley U.D.	...	...	51
Buglawton U.D.	...	...	55

Some of the above figures, relating to both high and low mortality rates are no doubt accidental and are due to the smallness of the statistics concerned. Probably a consideration of the statistics over a period of 5 or 10 years would shew different results. On the other hand there may be, in some of the districts of low infantile mortality, factors concerned

INFANTILE MORTALITY IN CHESHIRE

FROM 1876 TO PRESENT DATE.



which, properly investigated and recorded, would throw useful light on some of the problems associated with this interesting question.

There is a decrease in the recorded mortality from such vague and indefinite headings as debility, atrophy, marasmus and convulsions indicating a gratifying transference to more accurately diagnosed causes.

As is to be expected the infantile mortality rate in the 6 Municipal Boroughs was considerably higher than the Urban and Rural Districts, namely, 128 per thousand registered births, as compared with 86 and 72 respectively. In Stalybridge and Dukinfield Boroughs the high rates of 166 and 163 were recorded, whilst in Crewe and Macclesfield the corresponding rates were 103 in each case. The extraordinary rate of 285 per thousand registered births in Compstall Urban District is the result of working on small figures as there were only 4 deaths of infants under one year of age but only 14 births registered.

The employment of qualified or adequately trained ladies for the visitation of newly-born infants, especially in the case of births occurring amongst working class persons, has proved a notable success not merely as affecting the infant lives, but also as, in the majority of cases, securing better hygienic surroundings for the whole of the family. This provision for lessening infant mortality should be now adopted in every Municipal Borough and large Urban working-class district, and in these areas the Notification of Births Act should be at the same time put into operation. It is recommended that your Committee urge the advisability of adoption of these measures on those Councils which have up to now been dilatory in the matter.

Coincidentally with this efforts should be studiously maintained towards an improvement of home environment and in particular to abolition of privy-middens and open ash-pits, proper paving of back-yards and passages, frequent and regular removal of refuse from the vicinity of dwellings and stringent regulation of the milk-supply. The question is merely one of the spending of money: public bodies can literally purchase life and health for the inhabitants of their areas if they are so minded.

The following Table shews for the Administrative County of Cheshire and England and Wales the infantile mortality rates for the past ten years:—

Year.	Cheshire.	England & Wales.	Year.	Cheshire.	England & Wales.
1910	93	106	1905	119	128
1909	99	109	1904	144	145
1908	113	121	1903	126	132
1907	112	118	1902	119	133
1906	118	132	1901	150	151

It will thus be seen that besides being the lowest rate recorded in Cheshire during the past ten years, the rate for Cheshire has on all these occasions been below that of the country as a whole.

The Seventy-second Annual Report of the Registrar-General gives information relating to the infantile mortality since the year 1876, and the following figures taken from that Report may be of interest.

The infantile death-rates in Cheshire have been as follows as compared with those for England and Wales as a whole:—

Period.	Cheshire Infantile Mortality Rate.		England & Wales Infantile Mortality Rate.	
1876-1880	...	140	...	145
1881-1885	...	137	...	139
1886-1890	...	146	...	145
1891-1895	...	155	...	151
1896-1900	...	157	...	156
1901-1905	...	138	...	138

The infantile mortality in the Municipal Borough of Congleton is less than the average for the previous 10 years, being only 118 per thousand births.

In the Borough of Crewe the infantile mortality is 103 per thousand births, as against 104 for the previous year. The deaths from convulsions, premature birth, and measles show an increase upon 1909, whilst those from diarrhoeal diseases show a decrease.

In the Borough of Dukinfield there has been a gradual decline in the infantile mortality rate during the last ten years, but the figure for 1910 is 163 per thousand births, a slightly higher rate than last year, and about the average for the previous ten years. The Committee give considerable

attention to the feeding of infants by means of sterilised modified milk, and the system of monthly reports on the results of inquiries into infants' deaths is continued. The Medical Officer of Health states that it is difficult to explain the high infantile mortality in this manufacturing district and knows of no specific cause at work.

In the Borough of Hyde the number of deaths of infants is 102, giving a mortality rate of 141 per thousand births. Compared with 1909 the number of deaths is less by 4, and with the average of the past 10 years the number is less by 42. The average infantile mortality rate for the previous 10 years is 177. Dr. Bennett attributes the lowered rate to the work done by the Ladies' Health Society (which has been very active and enthusiastic during the year) and the cold wet summer and autumn, which would reduce the number of deaths from diarrhoeal diseases.

The deaths of infants in the Borough of Stalybridge during 1910 numbered 103, as against an average of 137 for the previous 10 years, but computed upon the number of births registered the infantile mortality was 166.5, as compared with an average of 201.5 for the previous 10 years. Dr. Hancock again comments favourably on the good work done by the Lady Sanitary Inspector, who visits cases reported under the Notification of Births Act. Wasting diseases account for 39 of the deaths, 17 are from convulsions, 7 due to bronchitis and 13 to pneumonia, figures which, in his opinion, serve to show the great part which improper feeding and exposure to cold have played in the causation of very many of these deaths.

In the Macclesfield Municipal Borough the infantile death-rate is 103 per thousand births, again a lower figure than has been recorded for some time. The Births Notification Act came into force on April 1st, 1909, and cases notified are visited by Health Visitors.

In the Higher Bebington District only one infant died under one year of age.

There were four deaths of infants under one year in the Bollington Urban District, giving a rate of 40 per thousand births. Dr. Main remarks that greater care is being taken with the new-born child. Cards as to the feeding and management of infants are left by the midwives after each birth, boat-shaped bottles are gradually finding more favour with the mothers, and a strict watch is said to be kept on

expectant mothers at the mills, none being allowed to work up to the day of their confinement as was formerly the case.

In the Bredbury and Romiley District, where the infantile death-rate is 86 per thousand, books of instructions on infant feeding are distributed *gratis*.

In the Ellesmere Port and Whitby District there is a considerable decline in the infantile death-rate, that for 1910 being only 80 per thousand births, as compared with 140 for the previous year and 124, the average rate for the preceding 8 years. This is a matter for pleasing comment when the exceedingly high birth-rate (42.4 per thousand) is taken into consideration.

In the Handforth Urban District where there were 27 births, there were no deaths amongst infants, this being the only district in the County without any infantile death-rate at all—an enviable but, having regard to the size of the district, not a particularly remarkable record.

In the Hollingworth District the infantile death-rate is given as 97 per thousand births. Dr. Pomfret attributes several of the deaths to the mothers returning to work too soon and putting their children out to nurse.

Marple Urban District has the lowest infantile death-rate ever known in the district, viz., 40.3. Dr. Burton attributes the decline to the greater care now taken by the mothers in feeding and the continued good work of Health Visitors. The marked absence of intestinal disorders, in his opinion, shows this plainly.

The rate in the Middlewich Urban District, 44 per thousand births, shows great improvement doubtless due to the energetic educational work of the Lady Health Visitor.

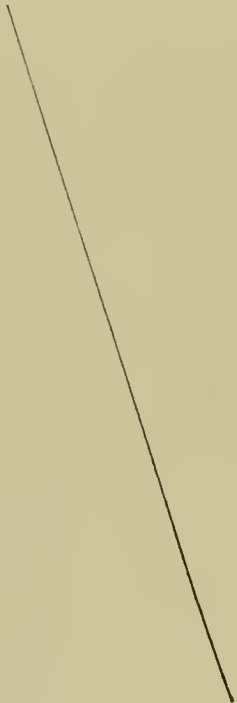
In the Mottram Urban District, the rate is 76 per thousand births. Dr. Awburn attributes the improvement to the increased care shown by the mothers in feeding. He states that the long rubber-tubed feeding bottle is seldom seen in the district.

In Nantwich Urban District, the infantile mortality is again high, 150 per thousand births, despite the good work of the District Nurse, who visits all the children born amongst the working classes. This is a matter for serious consideration by the District Council.

There is a steady decline in the infantile death-rate at Neston and Parkgate, this year's being 44 per thousand births. Dr. Yeoman attributes this to the energetic efforts of the District Nurse.

In Wallasey Urban District the infantile mortality rate is 86 per thousand births. Dr. Barlow directs attention to the number of deaths under one month, and has advised the Council to adopt the Notification of Births Act for the ensuing year. One of the reasons influencing the giving of this advice has been the fact that there were 70 deaths due to diarrhoeal and wasting diseases, and of this number 31 took place in infants under one month of age. Inquiries have been made in Wallasey into the causes and circumstances attending the deaths of children under one year of age and the results have shewn the importance of breast-feeding. Of the deaths of children under one year of age 35 were breast-fed, 72 were bottle-fed, 11 were not fed at all, and particulars were not ascertained with regard to 14 of the deaths. "It will thus be seen that although six times more children are breast-fed than are bottle-fed, there are actually double the number of deaths of bottle-fed children."

Dr. Barlow gives the results of a special inquiry made by him on the effects of industrial employment of married women on infantile mortality, which I reproduce here:—



"In dealing with such small numbers, one must be very careful not to attach too much importance to any inferences drawn therefrom. With respect to the enquiries I conducted, the results pan out in accordance with what one would have expected. The industrial employment of women, simply because it takes the woman from home, must necessarily result in a smaller number of children being naturally fed, and this of itself must inevitably lead to a larger rate of infant mortality among them.

"Table A. shows that in the *first* month of life a *larger* percentage of children was breast-fed amongst mothers *industrially* employed than amongst those not industrially employed. This may be taken to conform to what one would expect, because, to be industrially employed, a woman must be more or less physically capable of doing work, whereas amongst those not industrially employed, there are, doubtless, some mothers not physically capable of doing work. The workers, therefore, as a whole may be expected to be physically more capable than the non-workers; a larger percentage, consequently, are able to feed their children naturally. The children, moreover, of the women who work, from the fact that their mothers are probably physically superior, possibly *start* life with some initial advantage.

"It will be noticed, however, that *after* the first month, the percentage of breast-feeding *more rapidly declines* amongst mothers industrially employed than among those not so employed. The effect is seen in Table C., where it will be noticed that, while there was no death in the first month amongst the children of those industrially employed, the percentage of the total deaths proportionately increases in the later months, presumably when imperfect feeding, the result, perhaps, of the mother's absence from home, has had time to have its effect."

In the Nantwich Rural District, where the infantile mortality is 90 per thousand births, Dr. Turner has prepared a pamphlet on the care and management of infants, which the midwives are instructed to deliver to every mother. Infants "nursed-out" are efficiently inspected by the Inspector under the Children Act.

The infantile death-rate in the Northwich Rural District is 63 per thousand births, and is 36 per thousand births less than the ten years average.

There is nothing particularly noteworthy in regard to the infantile death-rate in any of the other districts.

Notification of Births Act.—This Act has so far been adopted by the following Local Authorities:—

Macclesfield Municipal Borough.

Stalybridge „ „

Bowdon Urban District.

Bromborough „

Knutsford „ „

Middlewich „

Nantwich „ „

Chester Rural District.

The want of administrative machinery to follow up the notifications is apparently responsible for the non-adoption of the Act. But in districts where infantile mortality rules high this Act undoubtedly affords the best means of its reduction, and it is therefore hoped that such districts, and particularly the Municipal Boroughs, will carefully consider the question and take progressive action.

It must be clearly understood that the adoption of this Act is not entirely a matter for the decision of the District Councils, for the Local Government Board have to approve of the action of the local Council, and in giving or withholding that approval the Board must apparently be satisfied that some machinery exists or will be put into operation in the district for utilising the provisions of the Act for the control of infantile mortality. That is to say the Council must make some arrangement by means of the employment of Health Visitors or otherwise for domiciliary visitation and the tendering of personal advice to mothers in cases where such visits are deemed desirable. It ought to be possible for some arrangement to be made, say with the County Nursing Association, for the part time service of a District Nurse in the visitation of cases where such is deemed necessary. This is done in Middlewich Urban District and Nantwich Urban District. Thus by the expenditure of a small sum annually the operation of this Act could be made reasonably effective.

It is open to the County Council to adopt the Act for the whole of the Administrative County, but, like all Local Authorities, they would have to shew that they possessed or would put into operation the requisite machinery for effectively carrying out the intention of the Act. In a few Counties the County Council has adopted the Act and made arrangements for carrying it out. If such a system were

adopted it might well include the supervision of midwives, the two things being carried out direct from the office of the County Medical Officer of Health.

The Local Government Board have the power under Section 3 of the Act to declare the Act to be in force in the area of any Local Authority who have power to adopt it, notwithstanding such Local Authority has not adopted it, but in the provinces one has not heard of any such declaration having been made.

The Municipal Boroughs of Crewe, Congleton, Dukinfield, and Hyde should, in my opinion, take steps to adopt the Act without further delay. Amongst other districts where the infantile mortality rules more or less high and where the operation of the Act would, in my opinion, work advantageously, are the following:—

Altrincham	Urban District.
Lower Bebington	„
Ellesmere Port and Whitby	„
Northwich	„
Runcorn	„
Sandbach	„
Winsford	„
Nantwich	Rural District.
Tintwistle	„

It is recommended that those Municipal Boroughs in which the Act has not been adopted and the Urban and Rural Districts mentioned above be specially urged to take steps to adopt the Act and make such local arrangements as are necessary for the effective operation of the Act in the reduction of infantile mortality.

Illegitimate Infants.—In very few Reports is there any allusion to this matter.

In the Borough of Crewe 3.8 per cent. of the births registered were those of illegitimate children, and during the year 5 deaths occurred amongst this class of children.

This Report also shews for a number of years the death-rate amongst illegitimate children, and with one single exception, this is higher than that of children born in wedlock.

In the Borough of Hyde, 21 illegitimate births were registered, and in the Borough of Macclesfield 49, equal to a rate of 7.2 per cent. of the total births. Although in Macclesfield a number of prospective mothers resort to the Workhouse situated in the Borough for their confinement, the illegitimate birth-rate in this Borough is an unusually high one. The figures given in certain other reports call for no special comment.

That the chances of life of the illegitimate child are but small compared with the child born in wedlock may be gathered from the following figures given by the Registrar-General (Seventy-second Report). The figures shew the deaths amongst legitimate and illegitimate infants at various age-periods in England and Wales during 1909:—

Age.			All Infants.	Legitimate.	Illegitimate.
Under 1 year	...	...	108.73	104.35	211.18
Under 3 months	...	...	60.12	57.61	119.37
3—6 months	...	...	19.20	18.17	43.00
6—12 months	...	...	29.41	28.57	48.81

At all the age-periods named illegitimate infants have only about one-half the chance of life of those born in wedlock and the number of deaths at very early ages is most striking. If the truth were known the term 'done to death' would in many cases be a more appropriate one than merely 'died.'

Still-born Children.—There is only one reference to this important matter in the Reports received, namely, in the Borough of Crewe, in which it is stated that during 1910 there were 78 still-born children interred in the Borough Cemetery, a number equivalent to 7.01 per cent. of the total births.

The registration of every still-birth under a certificate signed by a medical practitioner should be made compulsory, for there is little question that many so-called still-births are not such at all.

It is hardly sufficiently known that the adoption of the Notification of Births Act ensures the notification of all cases of still-birth—an additional argument for the putting in force of this most useful measure.

Deaths from Zymotic Disease.—Under this heading are included deaths from certain zymotic diseases specially

scheduled by the Registrar-General, namely:—small-pox, scarlet fever, measles, diphtheria (including membranous croup), whooping-cough, fever (typhus, typhoid, continued, and ill-defined fevers of uncertain origin), and diarrhœal diseases of zymotic origin. The death-rate in the Administrative County from this group of diseases during 1910 was 0.77 per thousand of the estimated population. In the 6 Municipal Boroughs it was 1.12, in the 36 other Urban Districts 0.74, and in the 12 Rural Districts only 0.47 per thousand of the estimated populations.

Under this heading there were 527 deaths in the County.

In England and Wales as a whole the corresponding rate was .99 per thousand, in the 77 great towns 1.23, in the 136 smaller towns .88, and in the Rural Districts 0.74. The rates appear to have been unusually high in the following areas:—

Runcorn U.D.	...	...	1.66
Crewe M.B.	...	...	1.44
Dukinfield M.B.	...	...	1.6
Winsford U.D.	...	...	1.6
Hyde M.B. ...	...	...	1.15
Lymm U.D.	...	...	1.4
Sale U.D. ...	...	...	1.3
Ashton-upon-Mersey U.D.	...	...	1.3
Congleton M.B.	...	...	1.3

Whooping-cough, diphtheria, measles, diarrhœal diseases, and scarlet fever have been responsible for the great majority of these deaths. Small-pox is responsible for one death, and typhoid and other fevers are included under the general heading "fever."

The deaths in the Administrative County from the various components of this general cause of death have been as under:

Small-pox	...	...	...	1
Measles	...	...	...	93
Scarlet Fever	...	...	...	51
Diphtheria	...	...	...	112
Whooping-cough	...	...	...	126
"Fever"	...	...	...	51
Diarrhœa	...	...	...	94
Total Deaths				527

The death-rates in Cheshire (Administrative County) and England and Wales from this class of disease for the past ten years have been as under:—

Year.	Cheshire.	England and Wales.
1910 ...	0·77	... 1·23
1909 ...	0·66	... 1·12
1908 ...	1·13	... 1·29
1907 ...	1·14	... 1·26
1906 ...	1·27	... 1·73
1905 ...	1·10	... 1·52
1904 ...	1·84	... 1·94
1903 ...	1·15	... 1·46
1902 ...	1·19	... 1·64
1901 ...	1·63	... 2·05

The rate for 1910 thus stands out as a pleasing record, though higher than that for 1909. Subject as this rate is to somewhat extreme fluctuations, chiefly due to the prevalence and fatality of diseases which are apt to occur in epidemic outbursts, too much must not be made of the statistics of a single year. A comparison with the records of previous years as to deaths from the various zymotic diseases is useful and interesting.

Presented as rates per thousand persons living these may be arranged as follows, comparative figures being given for the ten preceding years:—

Year.	1910.	1909.	1908.	1907.	1906.	1905.	1904.	1903.	1902.	1901.	England & Wales. 1909.
Smallpox ...	0·001	0·0	0·0	0·0	0·0	0·0	0·03	0·02	0·003	0·00	—
Measles ...	0·13	0·18	0·21	0·35	0·13	0·23	0·48	0·10	0·33	0·15	0·35
Scarlet Fever ...	0·07	0·12	0·12	0·10	0·11	0·09	0·10	0·15	0·11	0·10	—
Diphtheria and Membranous Croup	0·16	0·11	0·15	0·14	0·15	0·17	0·15	0·18	0·24	0·23	0·1
Whooping Cough ...	0·18	0·06	0·23	0·25	0·14	0·16	0·35	0·32	0·19	0·24	0·20
Fever ...	0·07	0·06	0·08	0·06	0·09	0·10	0·11	0·06	0·11	0·17	—
Diarrhoea ...	0·13	0·22	0·34	0·19	0·65	0·35	0·62	0·32	0·21	0·74	0·29
Total rate ...	0·77	0·66	1·13	1·14	1·27	1·10	1·84	1·15	1·19	1·63	—

The fluctuations in the case of the mortality rates from measles, whooping-cough and diarrhoeal diseases are well seen in this Table. Scarlet fever presents a comparatively low and even mortality rate during the ten years shown. Diphtheria presents a mortality rate which steadily diminishes from 1901 onwards down to a figure in 1909 less than half of that shown at the commencement of the disease—a result due doubtless to the increasing use of antitoxin. The rate of mortality from “fever” has not varied very greatly. The rates for a few of the diseases for 1909 for England and Wales are given for comparative purposes.

Scarlet Fever.—There were 51 deaths due to this disease during 1910, 26 in the Municipal Boroughs, 15 in the 36 other Urban Districts, and 10 in the 12 Rural Districts. The death-rate from this disease in the Administrative County was 0.07 per thousand persons living.

Last year there were 79 deaths from this disease in the Administrative County, the death-rate being 0.12 per thousand of the estimated population.

During the past 40 years the fall in the mortality from scarlet fever has been remarkable, not only in this County but throughout the whole country. The disease still remains exceedingly fatal to children under the age of 10 years, and particularly to children in the first five years of life. The decline in scarlet fever mortality as a whole is now regarded as being due to a milder form of infection rather than a diminished occurrence of the disease. The returns of the Metropolitan Asylums Board from 1872 onwards show that the number of deaths occurring in the huge number of scarlet fever cases treated annually in these hospitals is steadily declining.

Diphtheria and Membranous Croup.—These diseases are now universally classed together as diphtheria. Very few cases now occur, however, where the term “membranous croup” is used. The number of deaths due to these causes during 1910 in the Administrative County was 112, a number equal to a death-rate of 0.16 per thousand persons living. This is an increase of 41 deaths over 1909, almost entirely due to the very serious epidemic at Crewe (referred to in the section of this Report dealing with infectious diseases), which resulted in 32 deaths.

From the Reports of the Registrar-General it is apparent that according to recent experience at all events, diphtheria

is much more destructive in the town than in the country, although it was in early years considered to be mostly a disease of country districts. This fact is particularly noticeable in children under 5 years of age, who die of it practically at twice as great a rate in the Urban Areas as they do in the Rural. In England and Wales the mortality from this disease in children under 5 years of age has practically been halved since 1901, but this diminution does not hold in children slightly older, *i.e.*, in the 5—10 year period of life who are living in Rural Areas, though it does hold for such children residing in Urban Areas. This decline in the mortality is almost without doubt due to the use of antitoxin. There is no question that a certain proportion of the deaths ascribed to such conditions as “quinsy,” “ulcerated sore throat,” “tonsillitis,” &c., are really of diphtheric nature, and as bacteriological examination continues to be more utilised for purposes of diagnosis, it is probable that a greater proportion of these deaths will eventually be recorded under the heading of diphtheria. That this is actually taking place to some extent at the present day is evident from the fact that the mortality from “tonsillitis,” “ulcerated sore throat,” “quinsy,” &c., is becoming smaller every year.

Whooping-cough.—There were no less than 126 deaths ascribed to this cause, a number equal to a death-rate of 0.18 per thousand persons living. The deaths occurred as under:

6 Municipal Boroughs	...	...	39 deaths.
36 Other Urban Districts	...	...	72 „
12 Rural Districts...	...	...	15 „

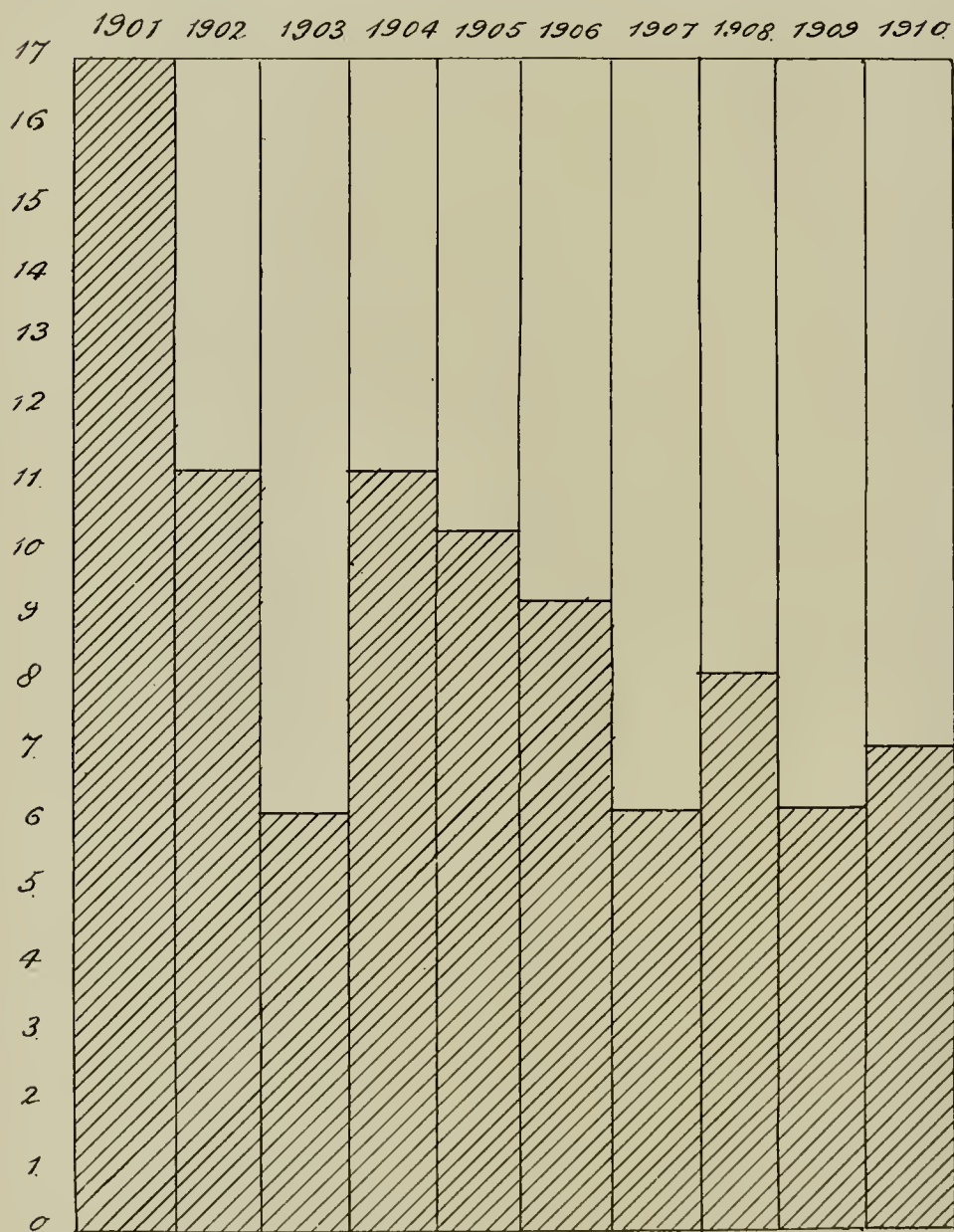
This is a considerable increase on last year—indeed 3 times as great a mortality—for in this year there were only 40 deaths; it is also the highest death-rate from any of the zymotic diseases.

There were 19 deaths in Wallasey Urban District, 12 in Runcorn Urban District, 11 in Dukinfield, and 11 in Stalybridge.

Dr. Park (Dukinfield) comments on the fatality of this disease to children under one year of age, and remarks:—“Concurrent epidemics of measles and whooping-cough are of frequent occurrence. Whooping-cough recurs at short intervals of two or three years in outbreaks that affect a large proportion of susceptible persons. Owing to the absence of rash and the insidious onset of the symptoms, this disease is

DEATH-RATE FROM "FEVER" IN CHESHIRE.

1901 - 1910.



rarely detected until many days after it has reached its infectious stage. Preventive measures are, therefore, not very successful."

Dr. Barlow (Wallasey) remarks that "whooping-cough, from a public health point of view is, if possible, more difficult of control than measles. Practically the only indication one has of its presence is by the death returns, since the sufferers for the most part are below school age. The period of infectivity, too, is very prolonged."

Whooping-cough is still almost confined in its fatal effects to children under the age of 5 years. Whereas measles, scarlet fever and diphtheria are more fatal in the second and fourth years of life, whooping-cough is more fatal in the first year of life than in any subsequent year of the first five. Another peculiarity of whooping-cough mortality is that it is greater amongst girls than amongst boys. In Urban areas children die from whooping-cough at a greater rate than in Rural areas, in some instances the mortality being from 5 to 7 times as great in crowded Urban districts as in the less populous Rural districts.

Fever.—This term embraces typhus, typhoid or enteric, and other continued fevers. As typhus fever is extinct except for very rare and isolated cases, and as continued fever is regarded as synonymous with enteric or typhoid fever this group of diseases may be looked upon as representative of typhoid fever only. The deaths due to "fever" in the Administrative County during 1910 numbered 51, equal to a rate per thousand persons living of 0.07. The death-rate from this disease or group of diseases has not been a high one in the County for many years. London is usually regarded as a City in which typhoid fever is present almost to a minimum degree, and the death-rates from enteric or typhoid fever therein for many years closely resemble those for Cheshire.

Cases of simple continued fever are becoming very much rarer than they were a few years ago, and are probably being transferred to the typhoid fever group. The same remark applies to the disease termed febricula. According to the Reports of the Registrar-General the mortality from typhoid fever has dropped considerably during the course of the last 30 years. The drop was very marked during the first 20 years of that period, but during the past 10 years it has not been so great. This diminution in mortality is due rather to lessened prevalence than to a diminution in the fatality rate

amongst those attacked. Another fact that is emphasised by the Registrar-General is that enteric fever is enormously more fatal in the town than in the country, and that both in town and country the death-rates in males above the ages of 10 years considerably exceed those in females. Dukinfield contributed 8 deaths to the total, and Wallasey and Crewe 5 each, but the remainder were spread fairly equal over the Administrative County.

Diarrhœal Diseases.—There are 94 deaths recorded in the Administrative County as due to diarrhœa, a number much lower than that for 1909. The diarrhœal death-rate was thus .13 per thousand persons living, a figure which is greatly below the average for the past ten years. The deaths occurred as under:—

6 Municipal Boroughs	...	25 or 26.6	per cent. of the total.
36 Other Urban Districts...	59 or 63.1	„	„
12 Rural Districts	...	10 or 10.3	„ „

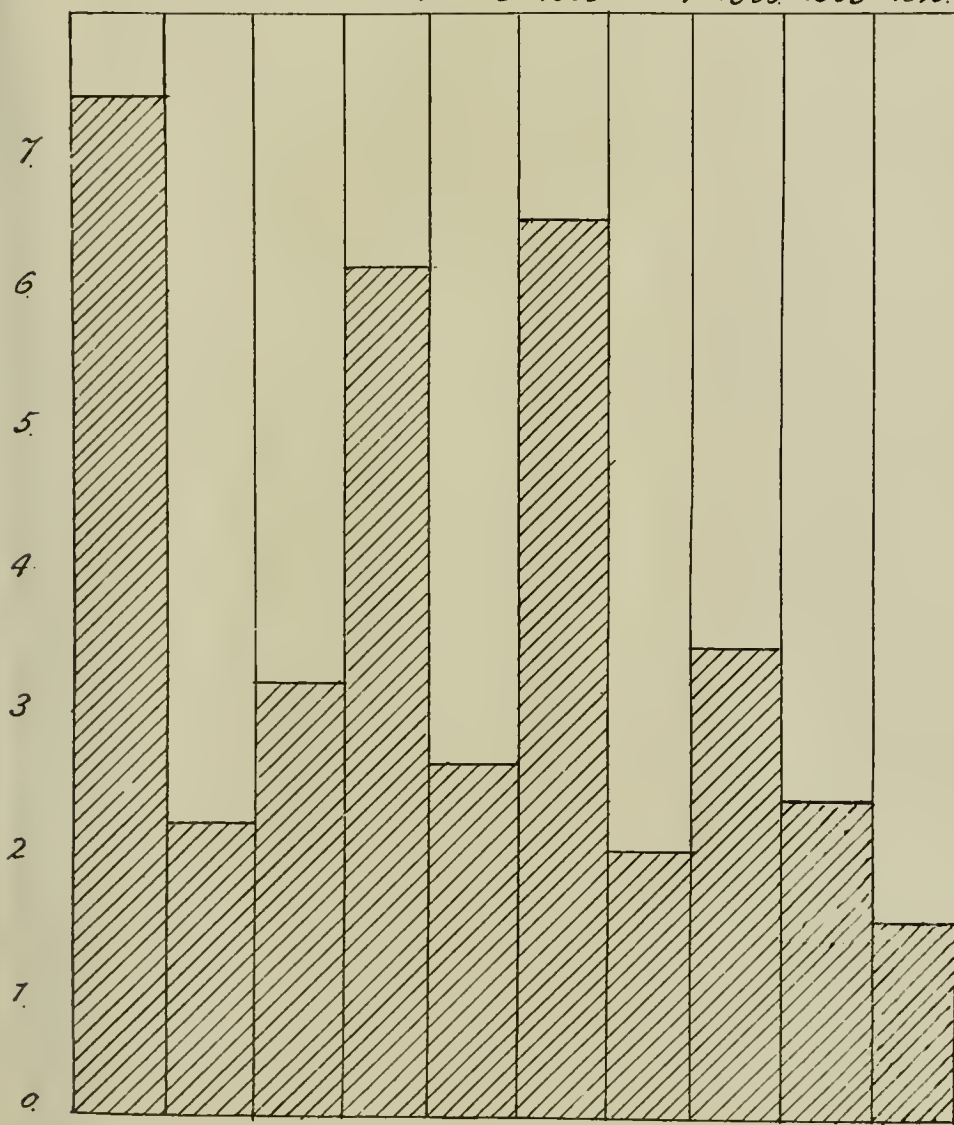
Crewe Municipal Borough had a somewhat large share of these deaths—8 in all, and Wallasey Urban District must be debited with 15 deaths from this cause. In Sale, Northwich and Winsford Urban Districts the numbers were also high, viz., 7, 6 and 6 respectively.

There still exists some confusion as to the names used to denote diseases of a diarrhœal nature. In many death returns it is common to find gastro-enteritis or gastro-intestinal catarrh. It is therefore important to observe that neither of these terms is sanctioned in the nomenclature of the Royal College of Physicians, and it is certainly expedient that their use should be discontinued altogether. The simple and unsatisfactory term diarrhœa, however, is gradually disappearing, and the more definite terms epidemic diarrhœa, or zymotic enteritis are taking its place. In view of the very high importance attached to diarrhœal diseases in connection with the problem of infantile mortality it is to be hoped that practitioners throughout the country will endeavour to assist those responsible for the public health by making use of the more definite terms mentioned. In the figures given above and in the statistical Table at the end of this Report the following diseases are included—epidemic or summer diarrhœa, epidemic infective or zymotic enteritis, dysentery, dysenteric and choleraic diarrhœa, cholera (other than Asiatic or epidemic), and cholera nostras.

DEATH-RATE FROM DIARRHOEAL DISEASES

1901 — 1910.

1901 1902 1903 1904 1905 1906 1907 1908 1909 1910.



Respiratory Diseases.—The chief of these are bronchitis, pneumonia and pleurisy. The total deaths in the Administrative County during 1910 from this group of diseases were 1,225, equal to a death-rate per thousand persons living of 1.8. The death-rate from this group of diseases during the past ten years has been as follows:—

Year.			Death-rate.
1910	...	...	1.8
1909	...	...	2.3
1908	...	...	2.08
1907	...	...	2.2
1906	...	...	2.12
1905	...	...	2.26
1904	...	...	2.52
1903	...	...	2.22
1902	...	...	2.58
1901	...	...	2.54

There is thus a perceptible decline in the death-rate from this class of disease, the rate recorded being the lowest for over 10 years.

Lobar Pneumonia is now definitely placed by the Royal College of Physicians amongst infective diseases, and for a good many years there has been a tendency amongst all connected with preventive medicine to regard every form of pneumonia as infective. From certain figures collected by the Registrar-General it would appear that the mortality from pneumonia is greater in town than in country districts by more than 75 per cent. In general the mortality of males greatly exceeds that of females, and amongst children under the age of 5 years pneumonia is particularly fatal.

Epidemic Influenza.—During 1910 there occurred 49 deaths in the County as the direct or indirect result of this disease. It is pleasing to note that this figure is nearly 100 less than last year.

No district appears to unduly share in the total.

Heart Diseases.—The number of deaths ascribed to the various forms of heart disease in the Administrative County during 1910 was 915, a number equal to a death-rate per

thousand persons living of 1.3. The six Municipal Boroughs are to be debited with 270 of these deaths, the 36 other Urban Districts with 408, and the 12 Rural Districts with 237.

All these totals approximate closely to the 1909 returns.

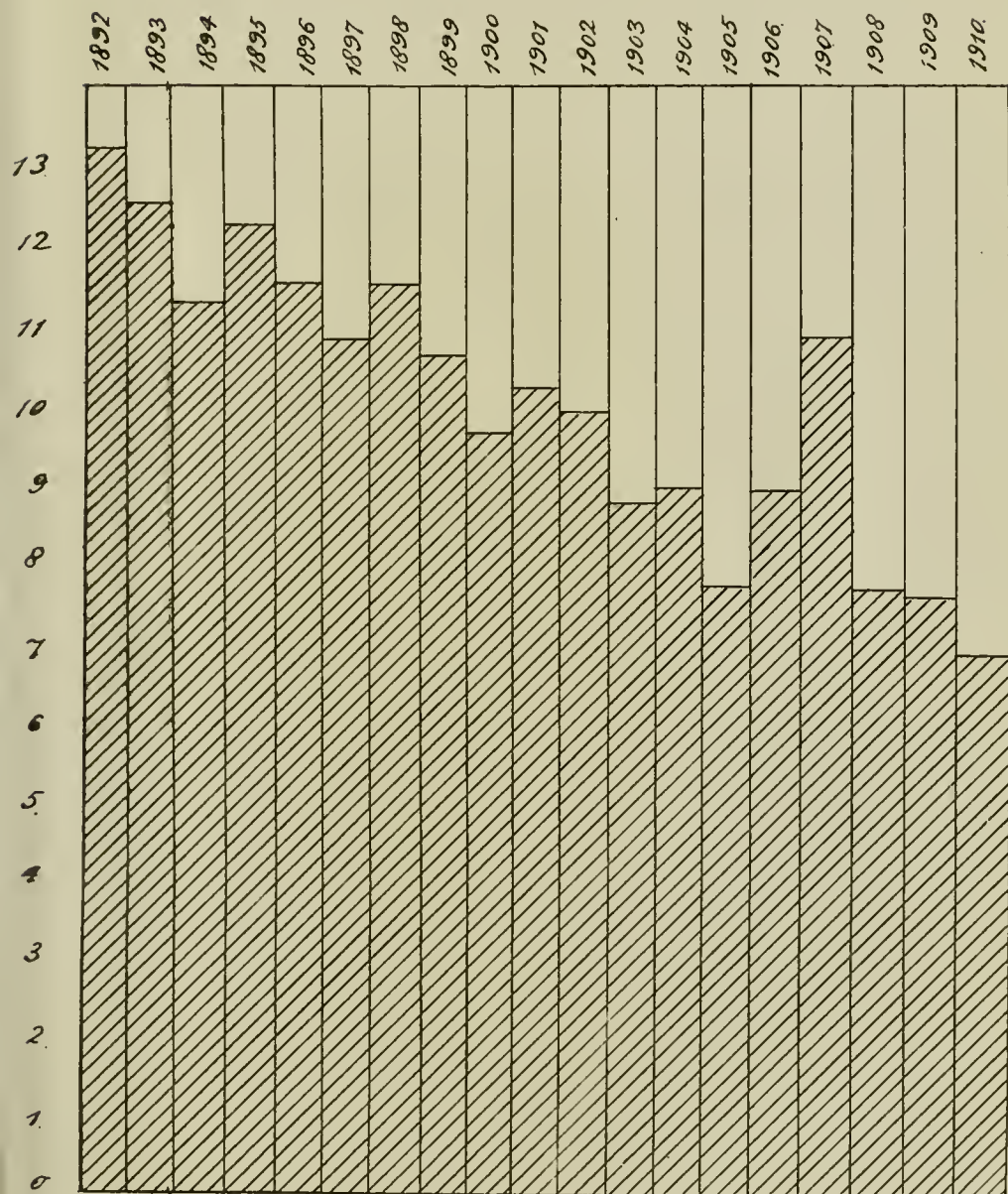
Pulmonary Phthisis.—This disease claimed no fewer than 487 victims during 1910 in the Administrative County, a number equal to a death-rate of 0.71 per thousand persons living. This is the lowest recorded rate for the County since the year 1892—as far back as I am able to obtain records. As the matter is one of very considerable interest, I append the rates for the County of Cheshire and for England and Wales as far as the latter are within my reach.

Year.	England and Wales.		County of Cheshire.	
1892	...	—	...	1.31
1893	...	—	...	1.25
1894	...	—	...	1.12
1895	...	1.426	...	1.22
1896	...	1.327	...	1.14
1897	...	1.356	...	1.09
1898	...	1.325	...	1.14
1899	...	1.339	...	1.06
1900	...	1.337	...	0.95
1901	...	1.264	...	1.02
1902	...	1.233	...	0.97
1903	...	1.203	...	0.86
1904	...	1.236	...	0.89
1905	...	1.140	...	0.76
1906	...	1.150	...	0.89
1907	...	1.140	...	1.08
1908	...	—	...	0.76
1909	...	—	...	0.74
1910	...	—	...	0.71

The death-rate from phthisis may therefore be said to be not far from being only half as great as it was 18 years ago. The decrease has been fairly gradual and steady throughout, and there is thus some hope of its continuance, provided there is no relaxation in the public and private efforts which are being made on all hands for the control of this provedly preventible disease.

There are still some loose terms used in death certificates for tuberculous conditions, and the old name “tabes mesenterica” is particularly to be noted. This name had now been expunged from the nomenclature of the Royal College of

DEATH-RATES FROM PHTHISIS (PULMONARY CONSUMPTION) 1892-1910.



Physicians, and it is to be hoped that the use of the name will before long be abandoned by practitioners.

Specific inquiries were forwarded to all the districts in the Administrative County early in 1911 in order to ascertain what steps were being taken in the matter of the prevention of consumption. The questions and replies are tabulated and submitted herewith. It is hoped that a complete statement will be available next year.

		Any system of notification.	Any sanitary inspection of Patients' houses.	Any disinfection of ditto.	Any distribution of advice.	Any action re spitting.
Municipal Boroughs—						
Congleton	...	No.	Yes.	Yes.	No.	No.
Crewe	...	Voluntary.	Yes.	Yes.	Yes.	No.
Dukinfield	...	No.	No.	Yes.	Yes.	No.
Hyde	...	Voluntary.	Yes.	Yes.	Yes.	No.
Macclesfield	...	Voluntary.	Yes.	Yes.	Yes.	Yes.
		1/- per case paid.				
Stalybridge	...	No.	Yes.	Yes.	Yes.	No.
Other Urban Districts—						
Alderley Edge	...	Yes.	Yes.	Yes.	Yes.	Yes.
Alsager	...	No.	Yes.	Yes.	Yes.	Sputum cups & anti-septics provided.
Altrincham	...	No.	No.	No.	No.	No.
Ashton-upon-Mersey	...	No.	No.	In case of death.	Yes.	No.
Higher Bebington	...	No.	No.	No.	No.	No.
Lower Bebington	...	No.	Yes.	Yes.	Verbal.	No.
Bollington	...	No.	Yes.	Yes.	Yes.	Yes.
Bowdon	...	No.	Yes.	Yes.	Yes.	No.
Bredbury and Romiley	...	No.	Yes.	Yes.	Yes.	No.
Bromborough	...	Yes.	Yes.	Yes.	Yes.	No.
Buglawton	...	No.	No.	No.	No.	No.
Cheadle	...	No.	No.	When requested.	No.	No.
Compstall	...	No.	No.	Occasionally.	No.	No.
Ellesmere Port & Whitby	...	No.	Yes.	Yes.	Yes.	No.
Hale	...	No.	Yes.	Yes.	Yes.	No.
Handforth	...	Information not furnished.				
Hazel Grove & Bramhall	...	No.	No.	No.	No.	No.
Hollingworth	...	No.	No.	No.	No.	No.
Hoole	...	Voluntary.	Yes.	Yes.	Verbal.	No.
Hoylake	...	No.	Yes.	Yes.	Yes.	No.
Knutsford	...	Voluntary.	No information.			
Lymm	...	No.	No.	No.	No.	No.
Marple	...	No.	Yes.	Yes.	Yes.	Sputum cups & anti-septics provided.
Middlewich	...	Voluntary.	No information.			
Mottram	...	Information not furnished.				
Nantwich	...	Voluntary.	Yes.	Yes.	Yes.	Yes.
Neston and Parkgate	...	No.	Yes.	Yes.	Yes.	No.
Northwich	...	No.	Yes.	Yes.	Yes.	No.
Runcorn	...	Information not furnished.				
Sale	...	Information not furnished.				
Sandbach	...	No.	No.	No.	No.	No.

			Any system of notification.	Any sanitary inspection of Patients' houses.	Any disinfection of ditto.	Any distribution of advice.	Any action re spitting.
Tarporley	...	...	Information not furnished.				
Wallasey	...	...	No.	Yes.	Yes.	Yes.	Notices exhibited in public places.
Wilmslow	...	...	No.	No.	No.	No.	No.
Winsford	...	...	No.	In case of death only.			No.
Yeardsley-cum-Whaley	...	...	No.	No.	No.	No.	No.
Rural Districts—							
Bucklow	...	...	Voluntary.	Yes, on occasion.	Yes, after death.	Yes.	No.
Chester ..	...	...	No.	No.	No.	No.	No.
Congleton	...	...	No.	Yes, if known.	Yes, on death.	Yes.	No.
Disley	...	...	No.	No.	No.	No.	No.
Macclesfield	...	...	No.	No.	No.	No.	No.
Malpas	...	...	No.	No.	No.	No.	No.
Nantwich	...	...	No.	Yes.	Yes.	Yes.	No.
Northwich	...	...	No.	Yes.	Yes.	Yes.	No.
Runcorn	...	...	Voluntary, without fee.	On re- quest.	No.	No.	No.
Tarvin	...	...	No.	No.	No.	No.	No.
Tintwistle	...	...	Information not furnished.				
Wirral	...	...	No.	No.	When requested.	No.	No.

Procedure in the matter of the prevention of phthisis in this County can only be said to be in an elementary stage, as may be gathered from a perusal of the above summary and of the following notes taken from the Annual Reports of the District Medical Officers of Health.

In 1906, the Crewe Corporation applied to the Local Government Board to have phthisis made a compulsorily notifiable disease, but were not able to obtain sanction. It was therefore decided to request the medical men of the town to notify cases voluntarily, and to admit suitable cases into an empty ward at the Isolation Hospital. Early in 1909 the use of the empty ward was discontinued, and an open revolving shelter to contain two beds was erected in the Hospital grounds. Six cases were treated in this shelter during 1910, and with the exception of one patient who developed an internal complaint and was removed home after two days, these patients stayed for periods varying from 4 to 10 weeks. Leaving out the case which was only in the shelter for 2 days great improvement was recorded in 3 of the cases, slight improvement in one, and very little change in condition in the other. Enquiries into the after history of these cases elicited the fact that three had since died, another was working as a joiner, and the remaining one had not worked since discharge.

A system of voluntary notification of this disease is in force in Hyde, but during 1910 only 15 cases were so notified. In every case the house was visited and careful instructions given as to the prevention of the disease.

In Macclesfield Borough voluntary notification has been in force since 1902, but the system is stated to be "practically valueless." The number of notifications received has dwindled from such numbers as 99, 48 and 59 in 1903, 1904 and 1905 to 6, 11 and 6 in 1908, 1909 and 1910. Arrangements are made for the bacteriological examination of sputum free of charge, and during 1910 there were 27 such specimens examined, 6 being returned as positive.

In Alsager cases of phthisis coming to the knowledge of the Local Authority are advised to have isolation carried out as far as possible, particularly as regards the other inmates of the house, are provided with sputum cups and the necessary antiseptics, and are given advice on other matters. The houses are visited on occasion, and in case of death the premises are disinfected by the Sanitary Inspector.

In Hale provision is made for the examination free of charge of sputa and discharges suspected of tubercle bacilli. Nine specimens were sent away of which two gave a positive reaction, and seven negative.

In Middlewich Dr. Melville says the system of voluntary notification is again a failure.

In the whole of the other districts, whilst very few if any special measures are carried out, no opportunity is lost of giving advice in cases where the disease is known to exist, in the supply of disinfectants and in the disinfection of premises on the occurrence of a fatal case. In every way, therefore, throughout the County the public is being at all events prepared for more radical measures in the matter of the control of phthisis. All the above measures tend to impress upon the public the fact that the disease is a communicable one, and moreover one which is specially amenable to proper hygienic measures in the home and in the workplace. The time is rapidly becoming ripe for compulsory notification and compulsory carrying out of certain preventive measures.

Details of special inquiries made into the history of phthisis cases are contained in the Report of the Wallasey Medical Officer of Health (Dr. T. W. N. Barlow). Continued

for a few years these will furnish most valuable data as to the causation of the disease and the factors influencing its incidence and progress. In the hope that this may stimulate similar inquiry in other districts I have reproduced Dr. Barlow's remarks pretty fully:—

“It is the practice in this district to disinfect after every death from phthisis. The method of disinfection is as follows:—The infected rooms are sprayed with a strong solution of formalin, and the bedding and clothing taken away to be disinfected by steam. Permission is asked from the landlord to strip the paper from the walls of the infected room and to limewash the ceilings. During 1910, 64 houses or parts of houses were disinfected, and 27 rooms stripped. Bedding, &c., was disinfected in 40 instances, other bedding was destroyed in 1 instance, and in 15 instances the disinfection could not be carried out, or was not considered necessary because of the short time in which the patient had lived in the house (sometimes only a single night).

“Disinfection is also carried out periodically in the houses in which known phthisis patients live, and on any change of their address the rooms formerly occupied by a patient are disinfected whenever possible. This, however, is found to be a very difficult matter. Some patients seem to have a perfect mania for changing their addresses. They are encouraged to notify me whenever they remove, and all have been supplied with stamped postcards, but it is very rarely indeed that they are made use of. We only find that they have moved their address on the occasion of the routine visit and may not find them again for several weeks. This is a very serious difficulty in carrying out supervision over these patients. Efforts are made to instruct them how not to become a danger to others, by care of the sputum, advocacy of the open window, advice as to sleeping, food, &c., but in many instances one is bound to confess that the time spent on this instruction is wasted. It is of no avail to tell a widow in receipt of parish relief that she should not sleep in the same bed as her children when she has only one bed, or to advise good food and warm clothing to people who find it hard to keep body and soul together.

“In a previous part of this Report I have referred to measles as a very common pre-disposing cause of phthisis, and it occurs to me that at those times when there is plenty of available accommodation at our Infectious Hospital it might be advisable to select cases of measles and treat them

there. It is possible by effecting a more complete recovery from that disease that the development of phthisis in some of them in after years might be prevented. If measles were not prevalent the surplus accommodation in the Infectious Hospital might still be made use of for the treatment of selected cases of consumption. I can see no reason why a ward should not be set apart in our Infectious Hospital for either or both of these purposes as occasion demands and opportunity offers.

"It appears to me that in regard to phthisis we are very apt to under-estimate the importance of the resistance of the individual, and devote too much time to killing the bacillus. I do not think it is even yet realised sufficiently that phthisis is to a very large extent a secondary product of long-continued ill-feeding and malnutrition, and that the efforts which will have most result in stamping out this terrible disease, will be exactly those which have been so efficacious in the past, viz., those which tend to improve the social well-being of the people, particularly as regards good housing, good food and temperance.

RESULT OF ENQUIRIES—FAMILY HISTORY.

"In 33 instances no previous history of phthisis among actual members of the family could be ascertained.

„ 12	„	one member of the family had died of phthisis.			
„ 11	„	two members	„	„	„
„ 2	„	three members	„	„	„
„ 1	„	five members	„	„	„

"These figures show that a history of a previous death in a family from phthisis occurred in 36.1 per cent. of the cases.

"The foregoing Table has reference to 59 persons, and includes notifications as well as deaths of phthisis patients. It excludes reference to those notified in 1909 and again notified in 1910, and also "repeat" notifications in 1910.

"Enquiries also showed that in 6 instances other members of the family were at present suffering, or supposed to be suffering, from phthisis. This is equal to 10.1 per cent. of the cases.

"With regard to the sources of infection, one case was a lithographer's apprentice who had been working alongside

an affected workman. In this trade I am given to understand that acid fumes are breathed by the workers.

COMMENCEMENT OF ILLNESS.

“Enquiries have also been made with a view to ascertaining the probable date of onset of the disease.

In 29 instances the illness was said to have commenced less than a year prior to notification of death.

„ 9	„ between 12 and 18 months	„	„
„ —	„ between 18 months & 2 years	„	„
„ 4	„ between 2 and 3 years	„	„
„ 5	„ between 3 and 4 years	„	„
„ 3	„ between 4 and 5 years	„	„
„ 4	„ between 5 and 6 years	„	„
„ 1	„ between 6 and 7 years	„	„
„ —	„ between 7 and 8 years	„	„
„ 2	„ between 8 and 9 years	„	„
„ —	„ between 9 and 10 years	„	„
„ —	„ between 10 and 11 years	„	„
„ 1	„ between 11 and 12 years	„	„

In the remaining instances the date of commencement of illness could not be ascertained.

ALCOHOL.

“The enquiries with respect to the use or abuse of alcohol in each case gave the following results:—

Intemperate, or heavy drinkers	...	...	11
Moderate drinkers	...	...	30
Abstainers	...	...	22
Not ascertainable	...	...	2

HABITS.

“Enquiries were made in each case as to the “tubercular” habits of the patient, viz., whether the sputum was burnt, and whether due precautions were being taken to prevent the infection of others. In 9 instances the patients were said to be of dirty habits, in 6 fairly clean, whilst in the remaining cases, so far as could be ascertained, the patients took every precaution.

“The sanitary conditions prevailing were as follows, the points particularly noted being whether the houses or rooms were dark, damp or dirty. In 20 instances the houses were damp or dark, or both, and in 8 instances were dirty.

“The value of the above particulars in throwing light on the local incidence of phthisis will be much enhanced when in future years the total number of cases enquired into is large enough to found definite opinions upon. The Order of the Local Government Board enjoining the notification of all cases coming under the cognizance of the Poor Law to Sanitary Authorities is, in my opinion, a very excellent measure, and one which, in many districts will, for practical administrative purposes, provide all the information which is necessary. I have always thought that the general practitioner was the person in whose power it lay principally to give the necessary instructions to people whereby they are enabled to prevent themselves from becoming a source of danger to their neighbours. No doubt this is always done as regards the better classes—in short, the people who would resent the interference of the Sanitary Authority. The poorer classes are those to whom suitable advice is, perhaps, not always given, and this is the class among which the efforts of the Sanitary Authority will largely lie. My previous experience of the voluntary notification of phthisis has not impressed me favourably. I found that in the first year a very small proportion of the cases was notified, and a decreasing number in the succeeding years.

“I found also that many of the cases were notified after death, thus giving me information which I could obtain in a day or two from the death returns, and, therefore, quite unnecessary. Moreover, I found that the cases which were notified were just those which are now notified through the Poor Law. The better class patients were those which were notified after death and simply for purposes of disinfection.

“With regard to the compulsory notification of phthisis, I do not think that the step is necessary in a town like Wallasey, especially when the arrangements for dealing with cases of phthisis are incomplete.”

Last year a new Phthisis Sanatorium was opened at Clatterbridge in connection with the Wirral Union Workhouse. The building, which is a one-storey one, was erected at a cost of about £1,200, and is a corrugated iron structure on brick foundations, the ceiling, floors and walls being lined

with asbestos slabs. The building will accommodate 12 male and 12 female patients. The wards are well heated, lighted by electric light, and special means of ventilation are everywhere provided.

Enough is surely known now about the causes of tuberculosis to enable Local Authorities to embark on some programme of preventive measures without feeling that they are merely experimenting with disease. To start with the dwelling—darkness, dampness, airlessness, dirtiness and overcrowding are all matters with which Health Authorities can and should deal in a rigorous and wholesale manner. The Housing and Town Planning Act gives ample powers, used in conjunction with the Public Health Act, 1875, for the remedy of such bad housing conditions and in particular for dealing with back-to-back houses, cellar dwellings and the like. The result obtained in Liverpool by a progressive and vigorous housing policy leading as it did to the halving of the phthisis death-rate in a slum area in the space of a few years is enough to convince anyone of the wisdom of such a system. Other Authorities will doubtless only be able to attempt things on a much smaller scale than this, but even if they only deal with a score or so of dwellings per annum and deal with these thoroughly they will be doing one of the best things possible towards the prevention of phthisis.

Combined with this there must be progressive education of the people for many of them literally do not know how to utilise the advantages of a properly constructed house.

A more efficient sanitary supervision of the milk supply than is usually carried out must be adopted. The Royal Commission on tuberculosis stated emphatically that "cow's milk containing bovine tubercle bacilli is clearly a cause of tuberculosis and of fatal tuberculosis in man." The cowsheds in many parts of this County are structurally far from what they ought to be. I have seen some lately in which the amount of cubic space per cow was under 200 cubic feet, whilst lighting and ventilation were all but absent. One can hardly speak too strongly about the neglect of public duty of a Council which permits such things to exist.

The periodical disinfection of houses or rooms occupied by consumptives is certainly not a matter calling for the expenditure of much time or money, but it is a measure which may considerably limit the spread of infection.

There is no special difficulty involved in the adoption of a Bye-law prohibiting spitting in or on public conveyances

and in places of public resort, but a glance at the tabular statement will shew that only 4 Councils out of 54 in this County have apparently deemed it worth while attempting any action at all in the matter of preventing indiscriminate spitting. The system of voluntary notification of phthisis is, in my opinion, an absolutely delusive one, and I cannot in honesty recommend any Local Authority to adopt it. Compulsory notification of all cases is on its way, and now that the public has been educated beyond the stage of generalised terror at the mention of consumption, the sooner it comes the better both for those who have to control the disease and for those who are suffering from it. Once notified it is fairly certain that the notification will be utilised (as it has been in other diseases) as a powerful lever in the remedying of the sanitary environment of the case. The establishment of Sanatoria for early curable cases will be given a most useful impetus by the State Sickness and Insurance Bill now before Parliament, and I feel assured that any opportunity for the adoption of this item in the programme of phthisis prevention will be eagerly grasped by your Committee.

What one would like to see in this County is some steady and persistent effort, however small, on the part of Local Health Authorities to utilise the powers they already possess in an endeavour to prevent the spread of this dire disease. Frankly speaking I am not by any means satisfied that the question is being or has been so seriously considered as it should be. Many Medical Officers of Health, discouraged rather than encouraged by the success of measures adopted in large towns, have conceived the idea that the matter is too big for them to tackle in a small district. Their perspective is surely all wrong. *Mutatis mutandis* what can be done in large towns can be done in small ones: if there be no slum area to be dealt with surely there are slum-like dwellings to be taken in hand.

I am not at all convinced that the Local Government Board is wise in declining to sanction compulsory notification of phthisis, even by smallish towns, on the ground (which it is understood is that which usually guides their action in this matter) that the sanitary staff and administrative equipment is not such as is likely to enable post-notification measures of prevention and precaution to be adequately carried out. The obtaining of accurate information must surely precede the plan of campaign as to prevention. If Local Authorities knew the extent and the whereabouts of phthisis cases my view is that they would very soon begin to ask for the how and why of the occurrences and would wake

up to the necessity of doing something in the way of prevention. Just as with other infectious diseases any energetic Medical Officer of Health on receiving a notification of phthisis would make it his business to enquire about the health of 'contact' or 'missed' cases, and it might most usefully be made legal for the Authority to pay for the private medical examination of such cases and receive a confidential report on them, including a bacteriological examination of sputum. The notification would lead to inquiries as to the milk-supply and workplace for example and such inquiries would naturally lead to the remedy of any unhygienic conditions discovered. The public would be aroused to a fuller appreciation of the risks of the disease, and it is not too much to say that, as with other infectious diseases, they would gratefully appreciate tactfully given information as to preventive measures.

Notification has preceded preventive measures in the case of other infectious diseases, and this has been followed by the adoption of a preventive programme.

The public generally have now been educated sufficiently to know that phthisis is an infectious and largely preventible disease and will suffer no shock if this fact is recorded in a medical certificate. All things considered, to my mind no really cogent reason has yet been advanced why phthisis should not without further delay be made compulsorily and universally notifiable.

The compulsory system of notification of phthisis by Poor Law Medical Officers appears to have been well followed up by Sanitary Authorities by the giving of instructions as to precautionary measures, disinfection of premises, bedding, &c., and cleansing of houses and rooms.

Other Tubercular Diseases.—In this group one includes tuberculosis affecting the lymphatic glands, bones, meninges or covering membrane of the brain, the peritoneum or lining membrane of the abdominal cavity, and tuberculosis of general systematic distribution. During 1910 there were 255 deaths ascribed to one or other of the above-named diseases, a number equivalent to a death-rate of 0.37 per thousand persons living. This is a decrease on the figures for previous years, for in 1909 the rate was 0.42, in 1908 it was 0.47, in 1907 it was 0.46, and in 1906 it was 0.47.

Cancer and Malignant Disease.—There were 580 deaths due to these various forms of disease during 1910—a number equal to 0.84 per thousand persons living.

The number of deaths varied from 156 in the 6 Municipal Boroughs to 285 in the 36 other Urban Districts and 139 in the 12 Rural Districts. Statistics in this County are only available as far back as 1900. It is not possible to give what is termed the corrected cancer death-rate, *i.e.*, the proportion of deaths from cancer to persons aged 35 years and upwards (in which class of person about 95 per cent. of the total deaths occur). The deaths are therefore perforce expressed as a rate per thousand of the total estimated populations. The figures are as follows:—

DEATHS PER 1,000 OF THE ESTIMATED POPULATION.

Year.		Cheshire.		England and Wales (approximate figures).
1900	...	0.70	...	0.82
1901	...	0.90	...	0.83
1902	...	0.74	...	0.84
1903	...	0.79	...	0.86
1904	...	0.79	...	0.87
1905	...	0.77	...	0.88
1906	...	0.85	...	0.90
1907	..	0.83	...	—
1908	...	0.84	...	—
1909	...	0.86	...	0.95
1910	...	0.84	...	—

Certain facts stand out clearly from the mortality figures given by the Registrar-General (Supplement to 65th Annual Report).

In the decennium 1891-1900 the death-rates in England and Wales from cancerous disease at all ages and in both sexes averaged 758 annually per million persons living, thus exceeding by nearly 26 per cent. the average death-rate in the preceding decennium. From the year 1851 down to the present time cancer has shown a steady and persistent increase. During the 40 years 1851-1900 the cancer death-rate amongst males has trebled and amongst females it has doubled. A large amount of this increase is due to the more frequent detection of cancer as the result of operation or of post mortem examination,—in other words to the more favourable opportunities for correct diagnosis available in recent years.

As regards local incidence of this disease during the periods 1881-1890 and 1891-1900, the mean annual death-

rates for both sexes in England and Wales were respectively 1,834 and 2,316 per million persons aged 35 years and upwards. The highest figures during the decennium 1881-1890 were reached in the following Counties:—

London	...	...	2252 per million.
Huntingdonshire	...	...	2133 „
Cambridgeshire	...	...	1996 „
Sussex	...	...	1979 „
Warwickshire	...	...	1960 „

The figure for Cheshire during this period was 1,765 per million.

During the decennium 1891-1900 the highest figures were:—

London	...	...	2759 per million.
Huntingdonshire	...	...	2682 „
North Wales	...	...	2477 „
Northumberland	...	...	2451 „
Warwickshire	...	...	2438 „
Cambridgeshire	...	...	2419 „
East Riding	...	...	2403 „
Cumberland	...	...	2403 „

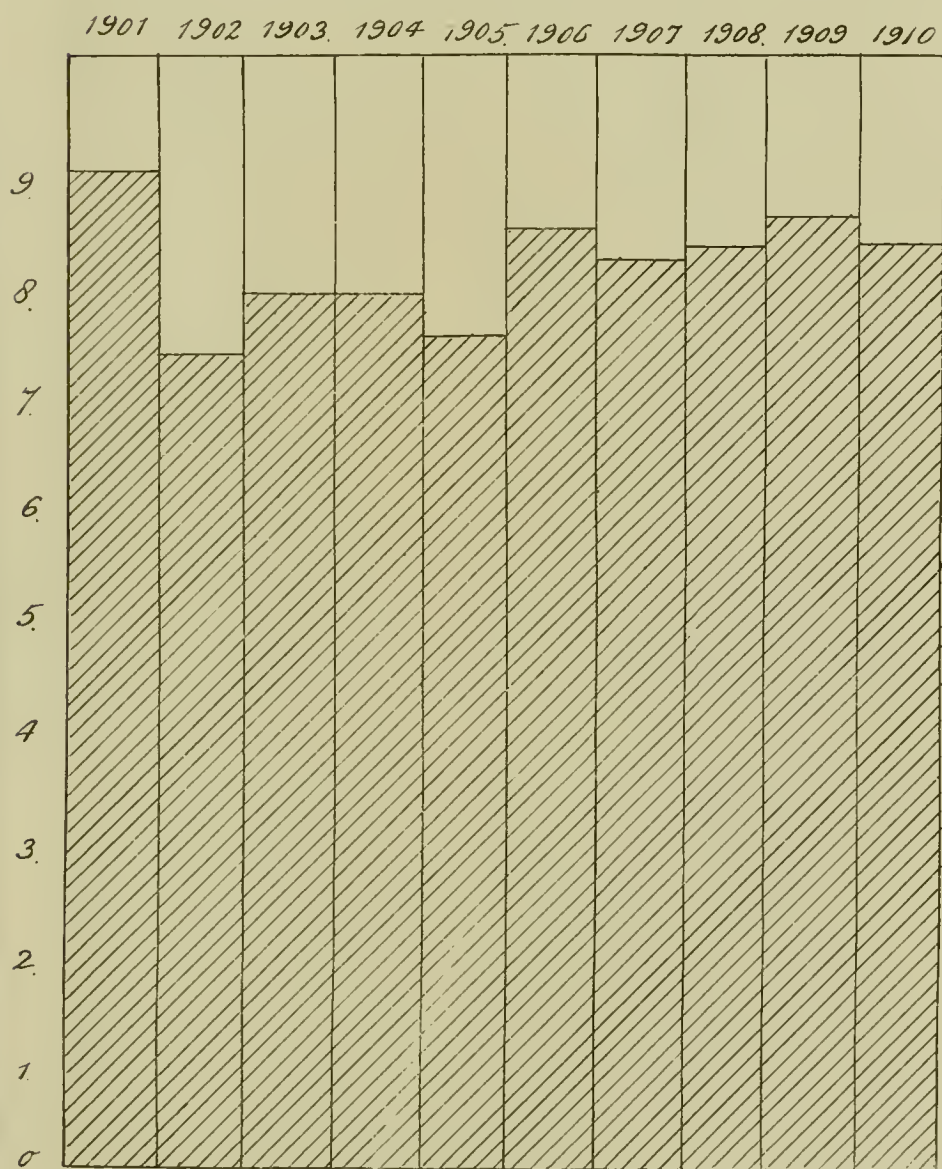
The corresponding figure for Cheshire was 2,339. Cheshire during the last decennium was tenth highest in the list out of 45 Counties. The lowest figures were for:—

Staffordshire	...	...	2098 per million.
Derbyshire	...	...	2089 „
Dorsetshire	...	...	2024 „
Buckinghamshire	...	...	1995 „
Wiltshire	...	...	1996 „
Monmouthshire...	...	...	1874 „

Two of the neighbouring Counties, Staffordshire and Derbyshire, thus present much more favourable returns than Cheshire. The other neighbouring Counties—West Riding of Yorkshire and Shropshire—have mortality figures for 1891-1900 of 2,169 and 2,326 respectively.

Amongst males the seat of this disease is most frequently the stomach, and this is the most rapidly growing form of the disease:

DEATH-RATES FROM CANCER AND MALIGNANT — DISEASE 1901 -1910. —



the liver and gall bladder are invaded in 13 per cent. of the whole, the rectum in 10 per cent., and the intestines in 8 per cent. Taken together the parts here specified are attacked in more than half of the fatal cases. Amongst females the generative organs and the breast are affected in more than two-fifths of the total fatal cases, and a further two-fifths of the total are contributed by affections of the stomach, liver, intestines and rectum taken together.

Cancer of the womb shews little or no increase in England and Wales during the past thirteen years, but the mortality from cancer of the breast "has increased by about 28 per cent. notwithstanding lives saved by improved methods of operation." (Seventy-second Annual Report of Registrar General).

That those who allege that there is not a real increase in the amount of cancer prevalent in the country have truth on their side is made evident by some recent declarations of Dr. E. F. Bashford, who has stated that it was established beyond doubt that the disease was not increasing uniformly, but only with reference to particular sites of the body. The influence of alcohol and tobacco certainly merit consideration, though chronic irritation cannot be made solely responsible for cancer occurrence. Cancer, according to Dr. Bashford, cannot be designated an infective disease, for it is transferred only by the implantation and continuation of growth of living cells or foci of infection and such a method of transference had not been noticed by him, though thousands of mice (used for experimental purposes) had been kept under observation for years. As against this theory too there was the fact that whereas in ordinary infections the greater the dose of infective material the greater the liability to the occurrence of infection, the transference of cancer was better ensured by the use of small doses than by the use of large doses.

The hope held out by immunity experiments had at present no sound foundation. In cases where animal experiments to this end had been tried it had been found that such methods were powerless to prevent continuation of growth, recurrence after operative removal or the formation of secondary foci of disease.

As regards hereditary predisposition the conclusions so far were that it was of no more practical importance than in the case of tuberculosis.

Sir George T. Beatson, M.D., K.C.B., has recently published some clinical findings in connection with this disease which are worthy of further circulation. He says, "To

associate the fat of the body with the causation of cancer may seem a far-fetched and most unlikely connexion, but it must be remembered that of late the relationship of fat to the working of the human body has been very extensively enquired into, and that it has been made evident that the fats of the body not only play no unimportant part in the phenomena of life, but they fulfil a number of functions. No longer can we assign to them as their sole duty the useful part of acting in a light portable and compact form as a reserve fund for the growing and working cells. They serve several other uses in the organisation. To these Leathes has drawn special attention and instances the following:—(1). They are of a protective nature, in illustration of which may be instanced their presence in the bodies of certain bacteria for example, the tubercle bacillus, where the presence of certain waxes increases the vitality and power of resistance of these organisms. (2). The phenomena of haemolysis has thrown much light on the biological significance of fat. As Leathes says, "The discovery of Bang and Forssman that the antigen which starts the formation of haemolysin is of the nature of fat raises the fats to a level of biological significance to which heretofore only proteins have been held to attain." (3). They take a part in the formation of "anti-bodies." (4). Fats may act as specific poisons. It has been shown that the ether extract of the red blood corpuscles of one species is toxic for animals of another species. (5). Lastly fats may help to build up the protein matter of the body. The cohesion of the protoplasm of the cells is due to the fats, viz., the lecithin and phospholipines,—present, and anything that affects this cohesion, brings about an alteration in the physical state of the cells, with the result that their vital functions come to a standstill. In short, fats are the cement which hold together organised matter, such as protoplasm, and with the loosening of this protoplasmic cement the processes of life can no longer be carried on. Fats then, play an important part in the organisation of cells, and one of the most recent views is that protoplasm is an emulsion of proteins and lipoids. In other words, there are "cell fats," and any causes that make them more fluid lead to their degeneration and destruction. What effects an excess of non-saturated fatty acids in the cells of the adipose tissue of a part may have on surrounding somatic cells can only be a matter of conjecture, but the important rôle played by fat in many of the phenomena of life may be said to justify further inquiries and research."

The prevention of death from cancer depends chiefly upon an early diagnosis. Although a few methods have been

devised recently with a view of assisting an earlier diagnosis by noting certain changes in the blood, none of these can be said to be trustworthy, and the older methods despite their disadvantages have still to be relied upon. Education of the public in the early or pre-cancerous symptoms, as has been previously advocated by me in these Reports, would doubtless lead to some cases of cancer at all events being rendered more amenable to surgical treatment.

Treatment by radium is still *sub judice*: it cannot be claimed at present that it is useful except in small and superficial lesions or as an adjunct to purely surgical treatment. Treatment by vaccines and sera has not up to now been successful except in a few cases.

Recently it has been stated that certain intestinal worms and skin parasites play the part of intermediate hosts, *i.e.*, that the cancer virus obtains a habitat in their bodies and is transferred by them from one individual to another. This is a pure hypothesis and does not appear to have been favourably entertained by the highest authorities on the causation of cancer.

In the vegetable kingdom and in the lower animals recent researches have demonstrated the existence of certain tumours apparently analogous in all respects to cancer in the human being. In particular, tumours which are fairly frequent in the sugar-beet and in allied plants bear a distinct likeness to cancer, and it has been shewn that such tumours can be grafted on to similar and allied species of beets though no causative parasite has yet been isolated.

Efforts are being made on an international scale to throw light on the causation of this dread disease but so far without tangible result. The only hopeful feature in connection with the disease is that surgery is year by year making considerable additions to the measure of relief which can be afforded once the disease is diagnosed.

Alcoholism and Cirrhosis of the Liver.—There are 72 deaths ascribed to these causes of death, namely, 19 in the 6 Municipal Boroughs, 39 in the 36 other Urban Districts, and 14 in the 12 Rural Districts. As remarked in previous Reports, however, this is no criterion of the effects of Alcoholism, for in the first place, the true cause of death is frequently not put on record, and, secondly, alcohol taken immoderately exerts an effect on practically every organ of the human body, inducing or hastening death from many other causes than cirrhosis of the liver.

Premature Birth.—To this is ascribed the deaths of 259 infants during the year under review. Of these deaths, 87 occurred in the 6 Municipal Boroughs, 120 in the 36 other Urban Districts, and 52 in the 12 Rural Districts. The deaths from this cause were very high in the Borough of Crewe, viz., 33, and above the average in the Urban Districts of Altrincham, Lower Bebington, Northwich, Runcorn, and the Rural District of Nantwich.

Diseases and Accidents of Parturition.—The deaths from this group of diseases amounted to 62 during 1910, a decrease of 11 on the number recorded for the previous year. As previously remarked one has here to consider not only the deaths but the number of women incapacitated for home and other duties by illness which in many cases might have been avoided by proper medical and hygienic treatment during pregnancy and confinement.

Puerperal Fever.—The deaths from this disease numbered 22 during the year in the Administrative County, the number of cases of the disease notified to District Medical Officers of Health being 45 during the same period. The fatality rate is thus seen to have been a distinctly high one, namely, 48.8 per cent. In the Crewe returns 4 deaths are scheduled from this disease, but only 2 notifications are stated to have been received—a curious but not very unusual anomaly. Further allusion is made to this subject in the section dealing with the Midwives Act.

SECTION III.

Infectious Disease.—The extended Table at the end of this Report shews the number and nature of the cases of infectious disease notified in the Administrative County during 1910. There were 4384 notifications received by the District Medical Officers of Health as follows :—

Small-pox	...	...	24
Diphtheria and Membranous Croup	...	...	982
Erysipelas	...	...	400
Scarlet Fever	...	...	2649
Typhus Fever	...	...	1
Typhoid Fever	...	...	235
Continued Fever	...	...	24
Puerperal Fever	...	...	45

A few cases of phthisis were voluntarily notified in certain districts. Measles were also notified to a slight extent in a few districts where notification is in force. Records of a few instances where whooping-cough or chicken-pox were voluntarily reported to the Medical Officer of Health are also to be found.

Small-pox. — LOWER BEBINGTON URBAN DISTRICT.-- An outbreak of small-pox occurred in this district in May, and again in August two further cases were notified. Happily there was only one death, and the fact that the outbreak did not assume more serious proportions is entirely due to the very prompt and thorough measures adopted by the Medical Officer of Health (Dr. Hill), who in his Annual Report says :—

“The most serious outbreak we had to deal with was small-pox. At first it looked rather alarming but fortunately for the district it soon abated. The first case was notified by myself on the 15th May, a boy of 5 years who had never been vaccinated. The second case was the boy’s father. When my attention was called to him he was in a convalescent state. On questioning him he informed me that he had met and been in conversation with a Spanish sailor at the back of his house. It appears the Spaniard had escaped from the Port Sanitary Hospital at New Ferry when he was being treated for small-pox. He seems to have been wandering about the district from 10-30 p.m. until the following morning when he was discovered by the police sheltering in a urinal at the back of Prospect Place, and taken back to the Port Sanitary Hospital. About 10 days after meeting the small-pox patient the man James became ill with pains in his back and headache, and noticed some spots on his face and arms, but he attributed his illness to influenza and only remained indoors for a few days and then returned to his work. When I saw him he had still some pocks on his face ; his attack apparently was only a slight one, no doubt due to the fact that he had been revaccinated about 10 years ago. The next case was that of a girl in the same street. On the same day my attention was called to a man whom the inspector had found in some shelter and who complained of being ill. He had tramped up from Staffordshire, but it was impossible to get any trustworthy account of his wanderings. It was quite clear that he had only come into the district the previous day and was not in any way associated with the other cases. He was found to be suffering from a modified attack of small pox. I understand he had been a soldier and had been revaccinated. He was at once removed to hospital. The next two cases were from the house adjoining where the

first cases were. It was then thought advisable to make a house to house inspection in Woodhead street, Prospect Place and Sea View, and during the three following days eight additional cases were discovered mostly of a modified type but all in an infectious state. It looked as if we were going to have a severe outbreak, as altogether 14 cases were discovered within 5 days, all in a very small area with the exception of one case, a man in Port Sunlight, and he had been working with one of the girls from Prospect Place who came from one of the infected houses, and who also developed the disease. All the cases were promptly removed to hospital and all those living in the infected houses were at once isolated and revaccinated and put under strict observation, not being allowed to leave their houses, food and everything necessary being provided for them, several of the Council's men were put in charge of the streets so as to prevent them leaving the place. It was found a very difficult matter to keep them in order and prevent them going about, and there was no possible chance of disinfecting the houses properly. The houses were small and dirty, and each house had a good number of inhabitants, in some cases two families being in one house, nearly all of the poorer labouring class, and cleanliness conspicuous by its absence. The Inspector and myself advised the Health Committee to procure tents and remove all the contacts to Pensby, where the Council had a field. This recommendation was at once carried out although it entailed an enormous amount of work on the Sanitary Inspector, who certainly did not spare himself, and it was due to his hard work that the necessary measures were so promptly and successfully carried out. I feel certain that the removal of all the contacts away from the district proved effective and prevented the outbreak spreading. Some may think it was rather costly procedure to take, but it must be remembered that if small-pox be allowed to become epidemic it may cause enormous expense to the district, so that in the long run it is cheaper to take effective measures from the first. During the time of the outbreak, Dr. Meredith Young, the County Medical Officer of Health, several times visited the infected area and was at all times willing to give us every assistance and advice. After the houses were emptied of the contacts they were thoroughly disinfected and the whole infected area was frequently inspected, all the people in the infected area being kept under observation until all danger of any fresh cases had died away. The contacts were kept at Pensby in the tents until the period of incubation had elapsed, and all kept well with the exception of one young boy who developed a slight attack and was at once removed to the hospital. In the Inspector's Report will be found particulars

regarding the cost of the tents, etc. We had a man on duty both night and day watching so that none of those in the tents were able to leave the field, and to see that the place was kept in a clean and sanitary condition. Earth closets were erected, and we also had a place erected for cooking and storage of food. During the outbreak over 500 people were re-vaccinated.

"In the end of August we again had two cases both in one house, husband and wife. The man died from a hemorrhagic type, the woman was also a severe case but she recovered. He was only ill three days and died before he could be removed. The woman was taken to the hospital.

"In the first outbreak there was no trouble in tracing the source of infection to the sailor who had escaped from the Port Sanitary Hospital. In the last two cases I was quite unable to trace any source of infection. The contacts in the house were re-vaccinated, and all sent to Pensby, and kept there the usual period, the house being disinfected. They all kept well.

"These two outbreaks of small-pox are an unpleasant reminder that in spite of science this loathsome disease continues to recur at intervals. It might be assumed that once a disease has been stamped out, its recurrence would be impossible, but experience has shown that small-pox is never entirely eliminated, possibly due to some mild cases that have never come under observation. What has been abundantly proved is that practical immunity from the disease is ensured by vaccination and re-vaccination, and it is surprising that prejudice against vaccination prevails even in these days when the lymph that is used is above all suspicion. Whether small-pox would eventually be exterminated if everybody was periodically vaccinated it is impossible to say, but in nearly every instance the people who are first to be attacked are those who have not been, or have not been properly vaccinated. People are not now so familiar with small-pox as they were years ago or the "conscientious objections" would not be so numerous."

WALLASEY URBAN DISTRICT. — Dr. Barlow reports as follows:—

"There were 7 cases of small-pox during the year. In reality there were two outbreaks at the same time, and there were many interesting features with regard to each, but so far as could be ascertained there was no connection between them, and the primary source of neither could be traced. The first case was that of J.B., aged 29 years, a worker in a

grain warehouse. He was taken ill on April 5th, the rash appeared on April 7th, and he was notified and removed to Hospital on April 11th. His wife and child were vaccinated on April 11th. The wife's vaccination took well. She, owing to her approaching confinement, was removed to the workhouse, and on April 20th was removed from the workhouse to our hospital, the rash just appearing. The re-vaccination showed four marks in the pustular stage with good areolæ. Her baby was born a day before the rash appeared, and was admitted with her to the Hospital showing no signs of small-pox. The baby was vaccinated on the day after admission (April 21st), and the vaccination took exceedingly well. On May 4th, when the vaccination was at its height, the baby developed a few pocks, the nature of which will be discussed later on.

"The third (G.B., aged 19) and fourth (C.B., aged 23) cases were brothers of No. 1. The illness was said to commence in both on April 20th, and the rash appeared on G.B. on April 21st and on C.B. April 22nd. The last two cases admitted to being in contact with the first case (J.B.) on Sunday, April 10th. They also saw him on April 5th, the day after the first case (J.B.) was taken ill. They strenuously denied contact between these dates, in spite of repeated questionings. These boys were both re-vaccinated on April 12th, which in the case of G.B., who had four scars of a very good primary vaccination, was unsuccessful, and in the case of C.B., who had three very good primary marks, a very slight re-action took place on re-vaccination. G.B. was a mild discrete case. C.B. had a semi-confluent attack and he promised to be severely ill, but the rash never went to pustulation.

"These cases show that the incubation period for small-pox may sometimes be either less or greater than the usual period of 12 days, for if with the normal incubation period they contracted small-pox on the first exposure, namely, April 5th, the rash ought to have appeared on April 19th. The incubation period must, in that event, have been prolonged. If, however, they contracted small-pox on the second exposure, namely, April 10th, the rash should not have appeared until the 24th of April, and the incubation period must have been shorter than the normal. (N.B.—The rash appeared on the 21st and 22nd respectively).

"The fifth case was G.D., aged 50 years, admitted to hospital, April 25th. He worked in a Flour Mill adjoining the place where J.B. worked, but apparently had never seen him. They certainly did not know one another, and no connection

whatever between the two could be traced. His primary vaccination showed four very small scars. The course of the disease was mild.

"The sixth case was Mrs. M.C., aged 62 years, admitted to hospital, May 14th. Mrs. C. was a visitor at the house of G.D., and was there on the day of his removal to hospital. She stated that she had only been in the house for a few minutes, had not been in the room where the patient was, and had not even seen his wife who was his only attendant. I was asked to see her on May 13th, and found a rash beginning to be vesicular, although she and the doctor positively asserted that the rash had not made its appearance until the preceding day, May 12th. Supposing it had first appeared on May 11th, it would still mean that in this instance the rash appeared on the 16th day instead of the 15th day after contact. Although Mrs. C. was 62, and had been vaccinated only in infancy, of which vaccination there remained three very faint scars, and although in the early stages she promised to be severely ill, the pocks died away in a most remarkable manner, not even proceeding to complete vesiculation.

"The seventh case was E.R., aged $3\frac{1}{2}$ years, admitted to hospital on May 24th. In many respects this was the most interesting case of the series. She was the daughter of one of the disinfecting staff. This disinfector had assisted in the removal of G.D. on April 25th, but had had no connection whatever with small-pox patients or bedding after that date. I may mention that this man was re-vaccinated unsuccessfully three years ago, and he stated that he had been vaccinated unsuccessfully three years before that. He went off duty ill on May 7th, and was attended by a doctor, whose certificate was to the effect that he was suffering from pleurisy. He returned to work on May 16th. On being closely questioned as to his illness it appeared that he vomited before leaving work on May 7th (12 days after removing G.D.), and about the beginning of his illness there had appeared on his forehead some spots which disappeared in a few hours. I was asked to see the child with a doctor on May 23rd, 16 days after the commencement of her father's illness and found the rash well out. There appeared to be no other way by which the child could possibly have become infected except by the father; and having in view the fact that the father's association with small-pox absolutely ceased after April 25th, and the child's rash did not appear until on or about May 21st, it seems almost certain that the illness from which he was suffering was an exceedingly modified form of small-pox, and that the child contracted the disease from him directly. This child had never been vaccinated,

and was, therefore, highly susceptible. She had a very severe confluent attack and was dangerously ill for several days, but ultimately recovered. I may mention here that the disinfectors, when handling infected bedding, clothing, &c., wear overalls, and when the bedding, &c., has been put into the disinfecting apparatus the overalls are put in also. The men have also definite instructions that they must carefully wash before leaving the hospital, and periodically disinfect their ordinary clothes.

“The question as to whether the newly-born baby who was admitted to hospital with her mother was suffering from generalized vaccinia or a modified form of small-pox, proved a difficult one to decide, and various opinions were expressed by different medical men who saw the case. The baby was born *while the mother was suffering from small-pox*, but one day before her eruption appeared. Exactly 15 days after the birth the baby developed the first pock. It should be remembered also that the mother had been re-vaccinated 8 days before the birth of the child, and her re-vaccination was very well advanced at the time of the birth. One would have expected the baby either to have developed the rash of small-pox concurrently with its mother, or that the combined effects of the vaccination and small-pox in the mother would have protected the child not only from the vaccination, but from small-pox also. The child's vaccination, however, took most vigorously, and the pocks appeared exactly at the time when the vaccination pocks were pustular, and had very large areolæ, when the arm was much swollen and the glands in the arm-pit were affected; in short, when the effects of vaccination were at their height. Some of the pocks were exactly like those of small-pox, but their distribution and behaviour differed considerably from the latter. For instance, the pocks appeared irregularly on the head, wrist, body, then head again, trunk, hands, and so on. Again, some of the pocks became pustular within an hour or two of their first appearance. Having regard to all the circumstances of the case, I myself was of opinion that the case was one of generalized vaccinia, although I would not like to be too confident, because I have never before seen a case. I read, however, that there are cases in which it is absolutely impossible to say whether the disease from which a person is suffering is generalized vaccinia or small-pox, however learned the observer, or however great his experience.

“In connection with this outbreak, it may be well to sound a note of warning on the tendency which is manifested here, as in other places, to neglect to take advantage of the benefits which vaccination affords as a protection against small-

pox. This is shown in two ways. First, by the increased number of exemption certificates applied for, and secondly, by the fact that even where a child is vaccinated it is often very inefficiently vaccinated, so inefficiently indeed that in all probability the protection afforded is gone, or greatly lessened, in a very short time. If the children are vaccinated by the Public Vaccinator, he is compelled to vaccinate in four places. No such obligation rests on the private practitioner, and there are some who respond to the appeals of the patient to the extent of vaccinating sometimes in one, sometimes in two places. In my opinion this should be forbidden by law. No one who has had any experience with small-pox doubts for one single instant the importance of vaccination as an absolute preventative, if the operation is recently performed, and in those cases not sufficiently recently vaccinated to be absolutely protected, vaccination modifies the disease, if contracted, in a most amazing way. A large number of medical men, nowadays, have never seen a case of small-pox, and it may be this is the reason why some place such small store on vaccination, and allow themselves to be persuaded to vaccinate only in one place.

“During the past year, chicken-pox has been very prevalent, and advantage has been taken, when visiting these cases, to ascertain the nature of the vaccination of those children so suffering. 208 cases were thus visited 2.6 per cent. were found to be unvaccinated. 16 per cent. had only 1 mark; 43.6 per cent. 2 marks; 10.12 per cent. 3 marks; 27.6 per cent. 4 marks. Thus more than half of the vaccinated children had 2 marks and under. In my remarks on vaccination, I do not wish it to be inferred that I reflect on the medical practitioners in this district in particular. As a matter of fact, I know that a very large number of infants in this district are taken to a neighbouring town to be vaccinated, because it is notorious that a certain gentleman in that town will meet the parents in the most handsome manner, and allow them absolute discretion in regard to choosing the extent of the vaccination of their children. There would be no objection to the vaccination of children in one place provided that at the age of ten all children were compulsorily revaccinated. The protection thus afforded would, probably, last them throughout life, except under exceptional conditions of exposure; but while the State requires vaccination only in infancy, and no revaccination, it is the best policy to make the most of what one can get, and vaccinate in four places while opportunity offers.

“It is a curious fact that at a time when vaccination as a protection against small-pox is gradually declining in favour,

the most promising advances in the modern treatment of disease are on analagous lines to vaccination, *e.g.*, tuberculin and various vaccines."

WIRRAL RURAL DISTRICT.—One case of small-pox occurred in a better-class residence in this district. The source of infection was not discovered, but small-pox had occurred in a neighbouring urban area (Lower Bebington) just prior to the illness of this patient. There was no spread of the disease owing to the prompt and effective precautions taken.

Measles—

BOROUGH OF CREWE.—There were sixteen deaths from measles, this being fifteen more than the previous year. The disease became epidemic towards the close of the year, necessitating the closure of five schools.

BOROUGH OF DUKINFIELD.—There were three deaths from measles at Dukinfield. It was necessary to close a number of schools during the year.

BOROUGH OF HYDE.—During the last two months of the year measles was very prevalent. There were eighteen deaths from the disease, the largest number in any district in the County.

BOROUGH OF STALYBRIDGE.—There were no deaths from measles in this Borough. Towards the end of the year, however, there were a number of cases, pointing to the probability of an epidemic arising, but this was fortunately checked.

ALDERLEY EDGE was remarkably free from measles.

ALTRINCHAM.—There were eight deaths from this disease. Dr. Golland received notifications of 117 cases during the year from the Head Teachers of the various schools, and remarks "that these notifications were very useful in enabling me to inspect and give directions in various circumstances."

BREDBURY AND ROMILEY.—There were no deaths from measles in this district. Dr. Cant comments on the Head Teachers' Weekly Infectious Disease Returns, instituted by the County Medical Officer of Health, which he says are a great help to him.

CHEADLE AND GATLEY.—Measles was prevalent in Cheadle Hulme at the beginning of the year. There were no deaths.

HALE URBAN DISTRICT.—Measles were rife in the latter part of the year, necessitating the closing of Stamford Park Infants' School.

HOOLE URBAN DISTRICT.—A serious outbreak of measles took place in this district in the months of April and May, due in the opinion of the Medical Officer of Health to an extension of an epidemic from the City of Chester. At the Workhouse 37 cases were recorded, resulting in 9 deaths, in spite of early isolation and other strict precautionary measures adopted. The case-mortality was a very heavy one, but the Workhouse Medical Officer states that all the children that died were weakly before contracting the disease. The premises were subsequently thoroughly disinfected, and no cases have since arisen there.

In Hoole proper, most of the cases were of a mild type, and occurred in children under the age of 6. Owing to measles not being notifiable in the district it was not possible to gauge the extent of the outbreak. There were two deaths. Special care was taken in the exclusion of school children and in carrying out other well-known precautions.

The following is a copy of a special report to the Local Government Board of an outbreak of measles during the quarter ending June 30th, 1910. The report is divided into two sections, No. I. dealing with the Chester Union Workhouse, and No. II. dealing with Hoole proper:—

NO. I. CHESTER UNION WORKHOUSE.—The first cases of measles occurred at the beginning of the last week of March at a time when the complaint was beginning to be prevalent in the City of Chester, and though the children affected were at once removed to the observation block, where strict isolation was enforced, the disease quickly spread, and during the following four weeks 37 cases were recorded. Each case when discovered was removed to the observation block and isolated there. Of the 37 cases one was under 1 year old, eight were under 2 years of age, four were 2 years old, nine between 3 and 4 years of age, seven were 4 years of age, six were 5 years of age, one was 6 years old and one was 7 years old. The mortality was very high, altogether there were nine deaths, the first occurring on the 27th of March, and the last on April 20th. The medical officer of the Workhouse informs me that all the children that died were weakly before they contracted measles, one had been suffering from tuberculous enteritis and another from nephritis. The premises were subsequently thoroughly disinfected and no cases have since arisen in the Institution.

NO. II. HOOLE PROPER.—As measles is not notifiable in the district, it is impossible to accurately gauge the extent of an outbreak, but the disease undoubtedly first began to be prevalent in Hoole Proper during the second week of April, and the outbreak was clearly due to the extension of an epidemic which had shown itself in Chester in the latter part of March and the beginning of April. Many of the Hoole children attend schools that are situated in Chester, and it is consequently quite easy to understand how the brothers and sisters of these children contracted the disease. The greater proportion of the children affected were under six years of age, and the disease for the most part was mild in type. The outbreak reached its height about the middle of May, and was practically extinct by the end of June. The teachers in the schools were told the leading initial symptoms of the complaint and every care was taken to exclude children showing such symptoms. The School Officer was consulted and it was not found necessary to close the schools, except the temporary infants' school in Westminster Road, where only very young children attend (a great many being under 5 years of age). This school was closed on May 12th, 1910, and re-opened on May 30th, during which time the room was thoroughly disinfected. No system of disinfection for measles of private houses is adopted in the district, except by request of the householder. The schools are visited from time to time, and school closure is adopted when thought advisable. Disinfection is carried out with formalin vapour by the Nuisance Inspector, and all children in infected families that have not already had measles are excluded from school. After June there were only a few isolated cases.

RUNCORN URBAN DISTRICT.—Measles was prevalent about midsummer, but was of a very mild type.

CONGLETON RURAL DISTRICT.—The disease was very prevalent here, causing six deaths. Dr. Bennett remarks that the mothers should consider the disease a more serious one than they do at present.

WALLASEY URBAN DISTRICT.—During the year 15 deaths occurred from measles. Dr. Barlow comments on the difficulty of controlling this disease owing to its being non-notifiable. He considers that children should not be allowed to attend school before 5 years of age, and thinks this would tend to curtail the epidemics, considerably lessen mortality, and probably lessen the baneful after-effects, since the older the child attacked the greater will be the stamina of the child, and the greater the likelihood of its only recovering, but of suffering less from succeeding complications.

Dr. Barlow also submits the following observations on the control of this disease :—

“While it has been shown in many instances that notification of the disease and isolation in hospital have had no effect in controlling its incidence, or indeed lowering its death-rate, I am of opinion that many of the remote effects enumerated above may be obviated, if measles cases could be taken from homes where the conditions are unsatisfactory, and treated in hospital. It would be an impossibility in times of epidemic to isolate anything approaching all the cases which could with advantage be treated in hospital; but I certainly think a selection might be made and the experiment tried. As I said last year in my annual report, home conditions are the determining factor in deciding the issue in the majority of cases. I am continuing my enquiries into every death. The numbers are at present too small to give in the form of a summary, but it is a striking fact, however, that with few exceptions, the deaths last year are of children artificially fed, thus confirming what has been stated over and over again, that breast feeding not only lessens the chances of death in the first year of life, but has a beneficial effect throughout life.

“Another aspect of this question deserves serious attention. The deaths from measles after the age of 5 years are practically nil. My further experience is to the effect that the *incidence* of the disease after the age of 5 is comparatively trifling. Children are not compelled to attend school before the age of 5. In the opinion of many even that age is too young (as a fact, in some continental countries, and in most of our colonies, the minimum age is 7), but in this country children at ages between 3 and 5 are almost universally admitted to school. Quite apart from the accommodation required for these very young children, and considerations as to the value of educating such young children which naturally occur to one, there can be no doubt that these children supply the bulk of the cases during an epidemic of measles, and there can be no doubt also that in many instances the disease is contracted at school. If these children were excluded from school it is probable that the biennial epidemics of measles would be averted or considerably curtailed in extent, and even if the effect were simply to alter the age incidence of the disease, I would point out that that would mean a lessened mortality, and probably lessen the baneful after effects, since the older the child attacked the greater the stamina of the child, and the more likely not only to recover, but to suffer less from the succeeding complications. Several years ago I expressed the opinion that the disadvantages

of allowing children below the age of 5 to attend school considerably outweighed the advantages, and I have seen no reason to change the opinion then expressed; on the contrary, instead of allowing children *below* 5 to attend school, the minimum age might, with advantage, be raised to 6."

Whooping-cough.—Although the number of deaths in several of the districts indicate that there has been an undue prevalence of this disease, in only very few cases has the matter been deemed worthy of comment. Dr. J. R. S. Park remarks of the disease as occurring in DUKINFIELD—

"Whooping-cough accounts for eleven deaths, compared with one in 1909, eight in 1908, seven in 1907, one in 1906, one in 1905, four in 1904, twelve in 1903, three in 1902, ten in 1901, fourteen in 1900, and 19 in 1897.

"Measles and whooping-cough accounted for all the deaths under one year from infectious diseases in Dukinfield in 1905, and for 15 out of 18 in 1906.

"Next to scarlet fever, whooping-cough is more fatal than any other disease in children, and in Dukinfield it is more fatal than scarlet fever. There is no doubt that in infants under one year it is the most fatal of all epidemic diseases. Concurrent epidemics of measles and whooping-cough are of frequent occurrence. It is interesting to notice the verification of this in Dnkinfield.

DEATHS IN THE YEARS.

Whooping-	1899	1900	1901	1902	1903	1904	1905	1906	1907	1908	1909	1910
Cough	1	14	10	3	12	4	1	1	7	8	1	1
Measles	15	37	7	13	6	18	10	2	41	5	8	3

"Whooping-cough is a typical epidemic disease, and recurs at short intervals of two or three years in outbreaks that affect a large proportion of susceptible persons. Owing to the absence of rash and the insidious onset of the symptoms, this disease is rarely detected until many days after it has reached its infectious stage. Preventive measures are therefore, not very successful."

In RUNCORN URBAN DISTRICT the Medical Officer of Health states that

"Twelve deaths from this troublesome disease were registered during the year; there were no deaths from this cause registered during 1909. Eight of the deaths were of

infants under one year, three deaths of young children of one year and under five years, and one death of a young person between five and fifteen years."

In WALLASEY URBAN DISTRICT 19 deaths occurred from whooping-cough, and 78 cases were reported by school authorities to the Medical Officer of Health.

No comments of note on this matter are made in the Reports of other Medical Officers of Health.

Scarlet Fever.—That this disease has been running riot during the year under review is clear from the fact that a total of 2649 cases have been notified to the various health authorities in the County. The districts which have suffered most severely from this disease are the following :—

			Cases Notified.		Deaths Registered.
Crewe M.B.	...	...	156	...	3
Macclesfield M.B.	...	...	284	...	5
Altrincham U.D.	...	...	24	...	0
Ashton-upon-Mersey U.D.	...	...	48	...	1
Lower Bebington U.D.	...	...	49	...	1
Ellesmere Port and Whitby U.D.	...	...	69	...	0
Hoole U.D.	...	...	81	...	1
Hoylake and West Kirby U.D.	...	...	39	...	0
Runcorn U.D.	...	...	100	...	3
Sale U.D.	...	...	113	...	2
Sandbach U.D.	...	...	33	...	0
Wallasey U.D.	...	...	329	...	3
Winsford U.D.	...	...	55	...	1
Bucklow R.D.	...	...	94	...	0
Chester R.D.	...	...	59	...	2
Congleton R.D.	...	...	54	...	0
Macclesfield R.D.	...	...	61	...	0
Nantwich R.D.	...	...	94	...	1
Northwich R.D.	...	...	153	...	2
Runcorn R.D.	...	...	186	...	4
Tarvin R.D.	...	...	59	...	0
Wirral R.D.	...	...	67	...	1

Although widespread throughout the County, the attacks—as has indeed been a general experience during the past 6 or 7 years—have been more or less mild and productive of but little mortality. The total deaths in the County from scarlet fever during 1910 were only 51 ; the mortality-rate per thousand of the estimated population was .07 ; and the fatality-rate or percentage of deaths to attacks was only 1.9.

The Registrar-General (Seventy-second Report), states that there has been an uninterrupted and very large decrease in the mortality from scarlet fever—the death-rate in 1901–1905 being less than one-sixth of that in 1871–1875.

The returns of the Metropolitan Asylums Board from 1875 onwards shew a steady decline in the fatality-rate as witness the following figures :—

Quinquennia.			Fatality-rate.
1875-79	...	...	13.5
1880-84	..	...	11.8
1885-89	...	...	9.1
1890-94	...	...	6.5
1895-99	...	...	4.0
1900-04	...	...	3.4
1905-09	...	...	2.8

Doubtless some correction must be applied to the above figures, for in the earlier periods “the cases admitted were for the most part severe with high fatality, whereas in recent years most of the known cases, including the milder ones, have been treated in hospital.”

In the BOROUGH OF DUKINFIELD Dr. J. R. S. Park has been for some time now carrying out what has come to be known as the Milne method of treating scarlet fever. Whether Dr. Milne, who is the Medical Officer in charge of Dr. Barnardo’s Hospitals and Homes, is the author of the treatment is understood to be open to question. The method of treatment is closely allied to, indeed almost identical with, what used to be known as the Curgeuven method, and consists in inunction of the skin with eucalyptus oil, and the treatment of the throat with an antiseptic solution. I quote Dr. Park’s remarks on the subject, but this without endorsing his opinions.

“Our method of procedure was as follows :—(1)—We requested the medical men of the town to meet the sanitary committee and discuss the treatment. This was well gone into and they all agreed to assist the authority in carrying it out as effectually as possible. Every pressure was laid on the importance of having a capable nurse to follow up each case and see that the treatment was carefully and effectually carried out. This suggestion, unfortunately, the Committee could not see their way at the time to adopt. Personally, I feel convinced

that had this been done our results would have been even more satisfactory than they have proved to be. (2)—Instructions were given to the parents of infected children as to the treatment. In most cases these instructions were so far as we know fairly satisfactorily carried out. At first we desired the children from the infected home to attend school; other parents, however, objected, and afterwards we decided that they should not be allowed to go to school.

“INSTRUCTIONS.—The eucalyptus oil, which is provided free by the Corporation, is to be used twice daily for the first four days, and afterwards once a day until the tenth day. The effect of this is to destroy the germs of infection on the skin right from the start of the disease, and *not* to wait until these germs have become disseminated, not only in the sick room and house but also in the air outside the home. If this is done effectually there is no risk of the other members of the family living and sleeping even with the infected person, and the danger of spreading the disease is, of course, minimised. The throat treatment should be carried out also right from the commencement of the illness, very frequently for 24 hours; afterwards, at the discretion of the medical attendant.

“We commenced our treatment in July, 1909. Up to the end of June 82 cases of scarlet fever had been notified, and as the maximum as a rule takes place in the autumn and the minimum in March I expected a much larger number of cases in the second half of the year. On the other hand only 64 cases were notified in the second half of the year. What has been our experience of these cases?

“Since 1898 we have the following notifications of scarlet fever :—

1898	1899	1900	1901	1902	1903	1904	1905	1906	1907	1908	1909	1910
85	91	85	60	120	30	111	47	95	169	112	146	52

“This is an average for the past 13 years of 92 cases. Let me take first of all the year, or rather the second half of the year 1909, when 64 cases were notified. In four houses duplicate cases occurred and were notified at the same time, all being infected at once. In four other houses cases were traced to infection from previous cases in the same home. In three of these four houses, through carelessness and laziness, the instructions were not properly carried out, and in the fourth house the drains were in an unsatisfactory condition, and had to be reconstructed and properly connected to the sewer. At the end of the first half-year's working the general opinion among

the medical men of the district was that they could not rely on the treatment—particularly the throat application—being carried out effectually. To do so a capable nurse should be employed, but considering the large number of cases (82) prior to the treatment we were better off than in the earlier part of the year. It was satisfactory to know that in so few houses even considering the want of real supervision as regards the treatment, second cases occurred. I then advised a continuation of this method of treating scarlet fever for a further period of 12 months, if possible, under supervision.

“During the year 1910.—The Inspector has made a special point of supervising the treatment of these cases, and I have pleasure in submitting a detailed statement of the 52 cases which were notified during the year.

“In six houses duplicate cases occurred, including 14 cases in all. In two houses in one case 2, in the other 3, took the infection at the same time and were notified together. In a third house two cases occurred within five days of each other. Here the treatment was not well carried out at *first* as there were other three children in this house who, after treatment was thoroughly attended to, did not take on the disease. In a fourth house the treatment was not carried out at all at first until three children had become infected. In another house the interval between the first and second case notified was nearly seven weeks. In the last house there is considerable doubt as to the second case being scarlet fever, as the house was disinfected nine days after it was notified. In these houses where the 52 cases occurred 135 other children were in close contact with the infected person.

“I have made an analysis of the cases during 1908 before this treatment was adopted, and I find that out of 112 cases notified 38 were duplicate cases. I have not been able to go into previous years, but I have no doubt that a like proportion of duplicate cases occurred.

“On grounds not only of efficiency but of economy I strongly advocate the continuance of this method of treating scarlet fever at home. Not only is the expense of maintaining a hospital for these cases saved, but if the treatment is really carried out from the onset of the disease strong disinfection and destruction of clothing, books and other materials are unnecessary. In 20 only of the 52 cases was disinfection of the house afterwards carried out, and that was at the wish of the people themselves rendered in the houses. In the other 32 cases no disinfectants at all were used.

'To summarize the advantages of this treatment are:—

- (1) Prevention of infection at the beginning of the attack, not waiting till convalescence when all the mischief has been done.
- (2) Children not compelled to leave home and go to hospital.
- (3) Cases milder. Throat infection less severe.
- (4) Duration of illness less. Average on cases being two or three weeks.
- (5) Children's education not interfered with, as there is no risk of infection being carried to school.
- (6) Infected children not to be kept in solitary confinement for a long period, six weeks or more, but allowed to mix with other children.
- (7) Mothers and children appreciate the treatment.
- (8) Satisfactory, efficient, economical.

"I am so satisfied with the results during the past 18 months that I recommend its continuance. At the same time if the Council can see its way to provide a thoroughly reliable nurse to see that it is properly carried out in every case, I am confident that the money will be well spent and the risk of duplicate cases nullified."

I only wish I could honestly share the sanguine opinions formed by Dr. Park. His experience has after all only been a very small one with this method of treatment, and in scarlet fever the type of disease is so aberrant and so varying in severity that a very long and extended series of cases is required before any sound conclusions can be drawn. One is familiar with cases where absolutely no precautions have been taken—indeed where Providence has been invited to cause a spread of infection—and yet no spread whatever has occurred. On the other hand, in some cases everything known to science may be adopted in the way of precautionary measures, and, in spite of this, the infection, as it were, laughs in our faces and spreads as it chooses.

I do not quite appreciate some of the advantages claimed by Dr. Park and stated in his summary. No. 1—"Prevention of infection at the beginning of the attack" is no special feature of this injunction method as seems to be implied; nor is "waiting till convalescence when all the mischief has been done" a fair

statement of the *rationâle* underlying, say, the hospital isolation method of treatment. In hospital treated cases antiseptic treatment of throats is begun at once in every case where there is any inclination of departure from health in the throat, and this treatment is continued so long as the condition remains. The skin, too, is treated in hospital cases by means of frequent disinfectant baths, and in many cases also by means of inunction.

Advantage No. 2—that ‘children are not compelled to leave home and go to hospital’ is one of very doubtful value. Children who do go to a well-appointed isolation hospital get many advantages over the child who is isolated at home. Hygiene and surroundings are better in such properly equipped hospitals, skilled nursing care is available at all times, the food is in most cases better than the child would be getting at home, the disciplinary training is excellent for the child, in the event of any complication arising which requires operative or special nursing attention skilled care is at once available and so on.

Advantage No. 3—“cases milder and throat infection less severe” is claimed in my opinion on insufficient data. Scarlet fever is a totally different disease nowadays to what it was 15 or 20 years ago, though whether it will retain this type always is somewhat doubtful. I can see no real justification for either of these statements; no figures are given showing the percentage occurrence of complications or their nature, the period during which pyrexia was maintained, the number of septic or toxic cases, &c. There has apparently been no sort of ‘control experiment’ made. The opinion is of course an honest one, but one would like to know what it is built upon.

Advantage No. 4—“duration of illness less” is somewhat vaguely expressed. What does ‘illness’ mean? Is it the total period from onset of preliminary symptoms to absolute cessation of all complications and sequelæ? In addition to the average period in this case, it would be well to note any extreme variations from such average, and the reason for such variations. Assuming that this average duration of illness includes the whole period as above defined, it must not be forgotten that in quite a large percentage of scarlet fever cases of the type which has been prevalent recently, the child is only ill in the proper sense of that word for a day or two and is virtually free from infection in 2 to 3 weeks.

Advantage No. 5—non-interference with education because no infection can be carried to school—is somewhat doubtfully expressed. Dr. Park probably means that the other children in

the house will not run the risk of carrying infection to school. If so, the same advantage could be equally well claimed for hospital isolation and for properly carried out home isolation.

Advantage No. 6—infected children being able to mix with other children—is a big claim to make, and one can only hope that this part of the system may always continue to be unattended by disastrous consequences.

Advantage No. 7—"mothers and children appreciate the treatment"—is, of course, what one would have expected: mothers and children being only human will always appreciate any method of treatment for illness which involves a minimum of trouble and discomfort for themselves. It may also be remarked that mothers and children in my experience, except in an infinitesimal number of instances, appreciate the benefits of isolation hospital treatment.

Advantage No. 8—that the method is satisfactory, efficient and economical—is very comprehensive. Any 'efficient and economical' treatment is surely also bound to be 'satisfactory.' As to its efficiency, I have my candid doubts; as to its economy, I can only hope that it will be so successful in the prevention of the spread of the disease as to be really economical in the long run. But as its economy depends on its efficiency, my doubts extend to the economy also.

I have felt it a public duty to offer these criticisms⁷ in the most friendly spirit, and with the hope that a much larger experience of the system in Dukinfield will prove them to be wrong.

In the BOROUGH OF MACCLESFIELD 284 cases of scarlet fever occurred and 257 of these were admitted to the Borough Hospital. The largest number of the cases occurred in the last quarter of the year. Five deaths occurred. Dr. Marsh remarks:—

"Although the number of deaths resulting directly from scarlet fever is small, yet it must be remembered that the death-rate gives but a small indication of the damaging effect which the prevalence of scarlet fever has on the children of the town. An attack of scarlet fever whilst sparing the child's life, in far too many instances leaves its mark in the shape of a damaged constitution; kidney and ear disease, heart disease and enlarged glands in the neck are but a few of the serious and life long damaging results which are prone to follow one of the mildest attacks of scarlet fever, and which are not recorded in the death returns.

“The present type of disease although mild is still very effective in leaving behind many children with wrecked constitutions.

“I believe the principal cause of the continued spread of the disease is to be found in the failure to recognise and isolate at the earliest moment the mild cases, which suffer from little save perhaps a transient rash, sore throat and few days of malaise and feverishness. These children are sent back to school or are allowed to mix and play with others whilst in an extremely infectious state, and so the disease continues to be handed on, and this will continue to be the case until some definite bacteriological evidence of the infectivity of these mild cases can be produced, as in the case of diphtheria, and the scarlet fever “carrier” isolated.”

Commenting on this disease as prevalent in STALYBRIDGE during 1910, Dr. Hancock states that:—

“During the year 76 cases of scarlet fever were notified, as compared with 153 in 1909.

“It will be seen from the number of cases, and the number of premises in which they occurred, that in some instances the disease recurred amongst members of affected households, and I am convinced that this recurrence was due to one or other of the following causes:—

(1.) Complete absence of isolation—the sufferer being actually nursed amongst other members of the household.

(2.) Incomplete isolation—members of the household passing in and out of the room where the sufferer was supposed to be isolated, or the attendant upon the sufferer intermingling with members of the household, with little or no precaution being taken; or, again, the sufferer during convalescence, and still in an infectious state, being allowed perfect freedom in the house.

(3.) Infection from some toy, book, or article of clothing which has escaped either destruction or efficient disinfection.

“Moreover, the cases having mostly been of a very mild type, and some of them not even being recognised until desquamation had commenced, I am of opinion that many

people have been somewhat careless of, or indifferent to, the disease, and that "contacts with cases" have intercommunicated more freely—at places of worship, Sunday schools, bazaars and sales of work, and places of entertainment—than they would have ventured to do had the disease been of greater severity. It is always more difficult for a Sanitary Authority to check the spread of an infectious disease in a mild form than in a severe form, because the public mind is so much less attentive to the consequences of the disease."

In the Urban District of ELLESMERE PORT AND WHITBY, Dr. Yeoman reports that:—

"The scarlet fever epidemic was a continuation of the outbreak of 1909, and the disease was of a very mild type. No deaths were recorded from scarlet fever.

"In connection with infectious diseases my visits were mostly to houses where the patients were kept at home, and were directed to ascertaining the character of the isolation, which was considered by the householders to be sufficient. In one instance where the home of a patient was a small shop dealing in food stuffs, the patient was moved to hospital under protest from the parent. My impression is that a much more extensive use of the Isolation Hospital would be of value to the community. Disinfection is thoroughly carried out after the occurrence of notifiable infectious disease.

"The district is contributory to the expenses of the Wirral Joint Hospital Board, who provide hospital accommodation at Clatterbridge, Pensby and Greasby."

In the HOLLINGWORTH URBAN DISTRICT 16 cases occurred of "extreme mildness and evanescence" during the whole of their clinical course. "Six weeks isolation has seemed unnecessary and even cruel."

In the HOOLE URBAN DISTRICT Dr. Butt reports that:—

"The 81 cases of scarlet fever were for the most part mild in type, and were reported from 55 houses; 69 of the cases were reported during the first six months of the year, and in July, August and September only one case was notified. The cases were pretty evenly distributed over the district. The chief streets affected were:—

Westminster Road	...	12
Bishop Street	...	11
Faulkner Street	...	10
Phillip Street	...	9
Clare Avenue	...	5

One case was reported from the Workhouse and one from Pipers Ash. The houses were all duly visited, sanitary defects remedied, and the premises were subsequently disinfected with formalin vapour by the Council's Sanitary Inspector. Full directions were given in all cases not removed to hospital as to the proper method of isolation and the use of disinfectants. The outbreak first showed itself in September, 1909, and reached its height in the earlier part of 1910. It was clearly due to the extension of an epidemic which had been in existence in Chester and the surrounding districts during the greater part of 1909. There was nothing to suggest the spread of infection by milk, water-supply, or sewerage. The schools were visited from time to time, and the names and addresses of all school children reported as suffering from the disease were sent without delay to the head teachers. As school attendance had but little perceptible share in its extension, it was not found necessary to advise the closing of the schools. In February six of the cases reported were traced to a small private school situated in the Chester Rural District area, and in March ten cases occurred in three houses as the result of direct infection from one to another."

RUNCORN URBAN DISTRICT has suffered pretty severely from scarlet fever during both 1909 and 1910. Dr. MacDougall furnishes the following information in his Annual Report:—

"One hundred notifications of scarlet fever were received during the year, 111 were received during the previous year—a decrease of 11 in favour of 1910. During the month of January, 33 notifications were received; during February, 20 notifications were received; during March, 16 were received; 5 and 7 were received for May and June, and the remaining 6 were distributed over the last six months of the year. The notifications received during the first six months of the year no doubt formed a remnant to the last quarter of 1909, for during the last three months of that year 85 cases of scarlet fever were notified. 86 houses were affected during 1910, and 35 cases were distributed amongst 14 houses; although it did not assume at any time the character of an epidemic, at all events

there was a good sprinkling during the last three months of 1909 and the first three months of 1910. Unfortunately, scarlet fever in a large number of instances is not taken too seriously, consequently it spreads and burns itself out."

In the WALLASEY URBAN DISTRICT there were 329 cases of scarlet fever reported, 127 of these occurring in the first quarter of the year. The disease was "of a particularly mild type," only 3 deaths occurring amongst the total cases notified; 229 cases were isolated in hospital. Dr. Barlow remarks on these cases:—

"I think it is the general experience with regard to scarlet fever that the exact source of a very small percentage only of the cases can be traced. Five of our cases, as far as it was possible to ascertain, contracted the disease outside the district.

"Forty-four of the scarlet fever cases notified at houses where two or more cases occurred, were removed to hospital at the following intervals:—

2 cases at an interval of 1 day <i>after admission of previous case</i>			
12	do.	2 days	do.
1	do.	3 days	do.
1	do.	4 days	do.
7	do.	5 days	do.
1	do.	6 days	do.
1	do.	7 days	do.
7	do.	7/14 days	do.
4	do.	14/21 days	do.
3	do.	21/28 days	do.
—	do.	28/35 days	do.
3	do.	35/40 days	do.
2	do.	40/50 days	do.
—			
44			

} Previous patients still in hospital when subsequent cases occurred.

In 13 houses 2 cases occurred and were removed to hospital at same

„	2	„	3	„	„	„	„	time.
„	1	„	4	„	„	„	„	„

"This shows the necessity of repeating what I have pointed out on several occasions, namely, that a little care on the part of parents in isolating children at the onset of the illness would have prevented many cases. It is quite a usual thing amongst the poorer people, when a child is taken ill, for it to be removed to the kitchen—the living

room—and if the disease happens to be scarlet fever, that of course means that every one in the house is exposed to infection. I have met several cases, indeed, in which *after* the disease has been diagnosed as scarlet fever the parents have brought the child into the kitchen preparatory to its removal to hospital, and the other children in the house have been playing with it.

Dr. Barlow is of opinion “that the isolation of scarlet fever in hospital has been attended by all the benefits which at the time of the establishment of the institution it was prophesied would result. It will be observed that when the percentage of cases removed was much below the average, the attack rate was considerably below the average also. Of course too much importance must not be placed on this fact, because the higher the incidence of disease, the larger will be the number of cases going into hospital, and the greater will be the number of concealed, unrecognised or missed cases, which in their turn tend to make the attack rate still higher. Moreover, the establishment of hospitals for scarlet fever can be justified on other grounds than their effect on the incidence of the disease, but, at the same time, there can be no doubt that many cases are removed to hospital which could, with perfect safety to the other members of the family and the public, be isolated at home. The only reason that can possibly be adduced for sending some of the extremely mild cases from good homes into hospital is that thereby the parents are saved some trouble. I do not sympathize with that view.

“During the year there have been five “return” cases amongst those treated in hospital, and three amongst those treated at home. As I have stated in my previous Report it is exceedingly difficult to state positively whether or not the second case was actually infected by the first. For instance, on December 15th, 1909, a case was notified at a certain house, a second case occurred on January 24th, 1910, while the first child was in the hospital. Again on September 20th a case was notified and removed to hospital, a second case being reported on the 29th of the following month, whilst the first was in hospital. If these two “first cases” in these instances had returned home a day or two *before*, instead of a day or two *after* the onset of the second case, no doubt these second cases would have been put down as “return cases.”

“With regard to the home-treated “return cases,” two of them were in one house. The infecting patient was

isolated for six weeks and one day, and two days after discharge developed a running from the nose, two days after the onset of which his brother and sister developed the disease. In the second instance, a boy was isolated for a very mild attack for a period of five weeks and two days. He had no complications either during the illness or after. Twenty days after discharge from isolation his sister developed scarlet fever. This, in my opinion, is a very doubtful "return" case."

In the BUCKLOW RURAL DISTRICT 94 cases of scarlet fever occurred, and Dr. Garstang reports that:—

"Thirty-nine of these occurred in the floating child population of the Cottage Homes, (where the daily average number of children was 561), spread over the whole year, with a special incidence in May, August and September. These cases were removed by the South Manchester Guardians to their own hospitals; and really had nothing to do with the Bucklow District. The remaining 55 cases were cases in the district in the ordinary sense. 17 Townships had no cases; 6 Townships had only 1 case each; Carrington had 3 cases; High Légh 4 (in one house); Rostherne 4; Dunham Massey 5; Northenden 6; Styal 8; and Timperley 19. Distances both of locality, and in time, separate all these from one another; and the only one that could be considered in any way "epidemic" was the Timperley outbreak of 13 cases in November and December. The Thorley Lane School was under some suspicion as a point of dissemination, but perhaps unjustly so, as the outbreak was definitely traced to the occurrence of several unrecognised (and not isolated or treated) cases in the first instance; and it disappeared as soon as active measures were taken."

In the NANTWICH RURAL DISTRICT 94 cases of scarlet fever were notified. Dr. Turner reports that:—

"The cases were generally difficult to account for. It will be seen from the Table which I append that the most affected townships were Church Coppenhall, Willaston and Worleston. The cases in the former two of these townships I believe to have been due to infection from unrecognised and certainly from un-notified cases. The cases at Worleston occurred almost together in the third week of August. They were all cases of children attending the Worleston School. I went to the school and was successful in finding out the cause of the outbreak. This was a small boy who had been thought by his parents to have been suffering from

measles. I found on examining him that he was "peeling" in the manner characteristic of scarlet fever. I had him isolated, obtained the closure and disinfection of the school, isolated the infected children either at home or in hospital and succeeded in stamping out the outbreak."

In NORTHWICH RURAL DISTRICT 153 cases of scarlet fever came to light during 1910; the cases were of a slight type and only 2 died. The Isolation Hospital was freely utilised.

In RUNCORN RURAL DISTRICT 186 cases were reported and 4 deaths occurred. The chief outbreaks were in Helsby (40 cases), Frodsham (27 cases), Halton (22 cases), Stockton Heath (19 cases), and Frodsham Lordship (14 cases). 100 cases were treated in the Isolation Hospital.

In the WIRRAL RURAL DISTRICT Dr. Yeoman reports that :—

"Sixty-seven notifications of scarlet fever were received. Fifty-six of these were treated in the Spital Hospital of the Joint Hospital Board, to the expenses of which you are a contributory body.

"In the outbreak at Upton in November and December, 1910, it appeared to me that the spread of the disease was occasioned by house visiting on the part of neighbours. All the persons attacked lived in close proximity to one another. Stripping of the walls, disinfection, and lime-washing were vigorously carried out. It was remarkable that at Upton, the persons attacked were nearly all below or above school age. There appeared to be no association with milk supply, as when examined by me farm hands and milk purveyors showed no evidence of any disease. The outbreak was short lived and subsided with extraordinary suddenness."

Diphtheria.—There were 982 cases of diphtheria reported in the Administrative County during the year: of these 369 occurred in the Municipal Boroughs, 333 in the 36 other Urban Districts, and 280 in the 12 Rural Districts. Crewe Municipal Borough suffered most severely, having 290 cases, Northwich Urban District had no fewer than 53 cases, Runcorn Urban District 38, Wallasey Urban District 44, Congleton Rural District 61, Nantwich Rural District 65, and Northwich Rural District 37 cases.

The total deaths in the County from this disease numbered 112.

This is one of the diseases the epidemiology and treatment of which has been almost entirely rewritten during the past ten or fifteen years, and administrative public health and school methods have had to be modified accordingly. That the antitoxin treatment has revolutionised the purely medicinal side of the question probably nobody except those endowed with exceptional prejudice will deny. That the prophylactic treatment by antitoxin, properly applied, could revolutionise the incidence of the disease much in the same degree as vaccination modifies smallpox there appears to be no reasonable doubt. The discovery of unexpected possibilities in the shape of "carrier" cases, however, has introduced a new perplexity into the problem, and administrative methods have had to be shaped in order to meet this flank attack. That "carrier" cases constitute a not inconsiderable part of the ground to be covered is manifest from the special investigation carried out by Drs. Buckley and Angus Macdonald during the serious prevalence of diphtheria in CREWE during 1910. Dr. Angus Macdonald has published (*Lancet*, March 25th, 1911) a most instructive account of no less than 90 diphtheria "carriers" discovered during six months special work in Crewe. The contacts were divided into "home contacts" and "school contacts," the former including members of the family in which the primary case had occurred and neighbours and friends who were so closely associated as to render infection probable, and the latter including those inspected at the school or place of work. Dr. Macdonald's paper emphasises the large number of possible "carriers" amongst the "home" contacts as compared with the "school or workplace" contacts, and the suggestion is made that intimate contact is essential for the transference of the infective bacillus from one person to another. This is borne out by an analysis of the "school" contact cases where it was shown that superficial inquiry was not sufficient to elucidate the causation, for the presumption that class-room contact was responsible for the distribution of the bacillus was not confirmed on close investigation, but the true reason was intimate association in the playground or in the surroundings of the home. In the same manner it would appear that the closer the intimacy in "home" carrier cases the greater was the chance of the infective bacillus being conveyed from one person to another. Dr. Macdonald infers from this, and quite rightly, that the prompt bacteriological diagnosis and isolation of positive cases will probably result in a diminution of the spread of this disease.

The classes of "carriers" in this disease it may be gathered from Dr. Macdonald's investigation fall into one or other of the following groups :—

- (1) Persons in whom the diphtheria bacillus resides

for a short time in the throat without producing any clinical evidence of diphtheria, *i.e.*, persons possessing a natural immunity against infection.

(2) Persons in whom there is present some definite local infirmity or lesion after an attack of diphtheria, and in whom the diphtheria bacillus finds a congenial place of lodgment, and is in fact difficult to dislodge.

(3) Persons with no history of diphtheria or its complications, but who possess throats in which the bacillus once implanted finds nothing inimical to its persistence, but on the contrary finds its surroundings favourable to existence at least though not favourable to its virulent manifestations.

(4) Persons who have a history of some indefinite throat trouble (probably abortive diphtheria) or who present some symptoms of the after-effects or sequelæ of diphtheria, *i.e.*, in whom the initial attack has been productive of few if any local symptoms but on whom the bye-products of the disease have produced some special or marked effect.

Dr. Macdonald is sanguine—and in these days of bacteriological infancy it behoves us to be exceedingly careful how we slight such probabilities—of the treatment of chronic “carriers” by the implantation on the throat of certain bacteria which are known to be keen competitors of the diphtheria bacillus or antagonistic to their growth in the hope that these may displace the causative bacillus of the disease. One would probably incline more to the greater prophylactic use of antitoxin and the destruction of the known bacilli *in situ* than to this somewhat problematic suggestion.

Dr. Macdonald's research work in connection with this very difficult problem will do much towards lifting the veil from this insidious and destructive malady, and whilst he is to be congratulated on his systematic and painstaking research, the Crewe Corporation are similarly to be congratulated on their public spirit in the spending of money towards the elucidation of a question of far-reaching potentialities.

No fewer than 290 cases of diphtheria were notified in Crewe during 1910; amongst these cases 32 deaths occurred giving a fatality-rate of 11.0 per cent. The epidemic was a continuation of one which commenced in September, 1909, and during 1910 the

notifications occurred at the following rate, Jan. 41, Feb. 41, March 49, April 31, May 25, June 27, July 15, August 10, Sept. 6, Oct. 13, Nov. 14, Dec. 18. Of the 290 cases, 173 occurred in school children, and the Beech Street Boys' and Infants' and Hightown Council Boys' Schools were specially affected, though cases occurred in almost every school in the town.

Dr. Buckley, then Medical Officer of Health, reports specially on this outbreak, and the following extracts are taken from his Annual Report :—

“As the notifications continued to increase in number month by month it became increasingly evident that only the wholesale examination of throats of ‘contacts’ would be effectual in checking the spread of the disease.

“For some years the Corporation have had an arrangement with the Public Health Laboratory of Manchester under which pathological specimens are sent for examination. This arrangement is an admirable one in ordinary times but is too expensive when examinations on an extensive scale are required.

“A consultation was held with the County Medical Officer (Dr. Meredith Young) and it was agreed that the most practicable scheme would be to appoint a temporary bacteriologist to work in the Municipal Laboratory. Dr. Angus Macdonald was appointed and commenced his duties in March, continuing until the beginning of November. A scheme was drawn up and adhered to as far as practicable, although it was not, of course, possible to carry it out in full when several cases from different schools and localities were notified in one day. On a case of diphtheria being notified it was at once removed to hospital and antitoxin administered, if this had not already been done. A swab was taken of every case. If the case proved to be positive or if, in spite of a negative result, it was thought that the case was one of true diphtheria, the house was visited and the other members of the family were ‘swabbed.’ In the case of a school-child his playmates and the other members of his school class, including absentees, were also ‘swabbed.’ All positive ‘contacts’ were isolated at home, but it must be confessed that the isolation was, in many instances, not satisfactory, as it was very difficult to persuade the parents that the child was a source of danger to all with whom he came into contact, being, to all appearances in good health. The important fact, however, was that the child was kept out of school. Ninety-seven ‘carriers’ in all, were discovered. None of these positive ‘contacts’ were allowed to

return to school until at least one, and in many cases two, negative swabs had been obtained.

“As a preventive measure, all positive ‘contacts’ were advised to receive an injection of antitoxin. The reason for this was that although many infected persons are able to resist the germs, others might, if the powers of resistance became lowered from any cause, contract the disease. Many of the ‘contacts’ acted on this advice and in no case, where this was done, did an attack of diphtheria follow.

“In addition to the above measures, the names and addresses of a large number of children absent on account of suspicious illness were sent by the Head Teacher to the Medical Officer of Health and were visited by him. In this way several cases of diphtheria were found where no doctor had been called in. Had it not been for the visits of the Medical Officer these cases would in all probability have been missed altogether and would, after a short absence, have returned to school in an infectious condition.

“Following the advice given in the ‘Memorandum on Infectious Disease’ issued by the Local Government Board and the Board of Education, no schools were closed. By keeping the schools open it was possible to find the infective cases, to obtain lists of children who were ill, &c. When an infants’ department was affected all children under the age of five years were excluded, usually for six weeks, as the disease is so very serious in younger children. This will be seen from the following table:—

Age.	No. of Cases.	No. of Deaths.	Percentage.
Under 5 years	79	21	26.5
5-10 „	110	8	7.2
10-15 „	53	2	3.7
15-20 „	15	0	—
20 & over „	33	1	3.03

“Infants under 5 years of age were excluded from the following schools on account of the prevalence of diphtheria:—

Hightown Council School	...	Feb. 17th to March 31st.
Beech Street School	...	„ „
Hightown L. & N.W. Ry. Co’s.	...	18th „
Mill Street School	...	May 23rd to July 4th.
Pedley Street School	...	„ „

"Where necessary, disinfection of schools and houses was carried out. The number of houses, the drainage of which was tested, was 211. Of these the drainage of 55 (26.06%) was found to be defective.

"A circular letter was addressed to the head teacher of each school and department giving advice on matters of hygiene, and insisting on the value of thorough ventilation, etc. Another circular was issued to parents. Each school child was provided with a separate bag or envelope of stout manilla paper in which to keep all books, pencils, etc., belonging to him.

"Of the persons affected and not attending school 69 were under and 48 over school age. A number of these contracted the disease from other members of the family who were attending school. The number of families affected was 228, and in 45 of these two or more cases occurred.

183 families had 1 case each.

32	"	"	2 cases	"
11	"	"	3	" "
2	"	"	5	" "

"Of the total number of persons affected 137 were males and 153 females.

"Two hundred and fifty cases were removed to hospital, of whom twenty-five died; forty were treated at home, of whom seven died.

"Of the 250 cases removed to the hospital—

19 were admitted on 1st day of the disease, of whom 2 died, 10.5 %

73	"	"	"	2nd	"	"	"	"	3	"	4.1	"
54	"	"	"	3rd	"	"	"	"	5	"	9.2	"
55	"	"	"	4th	"	"	"	"	7	"	1.09	"
21	"	"	"	5th	"	"	"	"	5	"	23.5	"
11	"	"	"	6th	"	"	"	"	0	"	—	
5	"	"	"	7th	"	"	"	"	0	"	—	
8	"	"	"	8th	"	"	"	"	1	"	12.5	"
1 was	"	"	"	9th	"	"	"	"	0	"	—	
1	"	"	"	11th	"	"	"	"	1	"	100.	"
1	"	"	"	13th	"	"	"	"	1	"	100.	"
1	"	"	"	24th	"	"	"	"	0	"	—	

Of the 25 cases admitted to the hospital 6 died the same day, a few hours after admission.

1 died on the 2nd day after admission

3	„	„	3rd	„	„	„
3	„	„	4th	„	„	„
2	„	„	5th	„	„	„
1	„	„	6th	„	„	„
1	„	„	7th	„	„	„
2	„	„	8th	„	„	„
1	„	„	11th	„	„	„
1	„	„	12th	„	„	„
2	„	„	13th	„	„	„
1	„	„	15th	„	„	„
1	„	„	23rd	„	„	„

“The majority of the cases were detained in hospital for about four or five weeks, but owing to the persistence of infection in many of them they were detained beyond that period—in one case for 120 days.

“The Health Committee have, since 1900, provided anti-toxin, first at cost price and since 1901 free of cost, but it is intended that the free supply of antitoxin should be only taken advantage of in the case of people too poor to pay for it. During the year 804 vials, each containing 2000 units, were used in this way ”

IN DUKINFIELD MUNICIPAL BOROUGH it is reported that :—

“Twenty-three cases were notified, with two deaths, compared with two in 1909, eight in 1908, none in 1907, one in 1906, one in 1905, none in 1904, one in 1903, six in 1902, and four in 1901.

“During the past year the deaths from diphtheria have been low, viz. : 8.7 per cent. It is remarkable that during the past ten years the deaths from this fatal disease have been so few, there being only 25 deaths out of about 200 cases. The cases of mortality in previous years have been as high as 30 per cent. and upwards. I attribute this to the fact that in most cases anti-diphtheric serum is used very early on in the illness and with excellent results, as there is no reason to believe that the attacks themselves are less severe. The Sanitary Committee have decided to supply the serum free of charge in all cases.”

In the HYDE MUNICIPAL BOROUGH there were 8 cases reported, and in these 4 deaths occurred. Antitoxin is supplied f. o. c. by the Corporation for use in the Borough.

In the BOROUGH ON MACCLESFIELD 16 cases were notified and 4 deaths occurred. Dr. Marsh further reports as follows :—

“192 swabs taken from the throat were sent to the Lister Institute and there examined for the presence of the diphtheria bacillus. In 62 swabs the diphtheria bacillus was found. In 3 of these cases Hoffman's pseudo-diphtheria bacillus was also present. In 40 cases Hoffman's bacillus only was found. The remaining swabs were negative.

“Two of the cases removed to hospital proved fatal.

“Diphtheria antitoxin of 2,000 or 4,000 Behring-Ehrlich unit per c.c. together with the loan of serum syringe, may be obtained free of cost for poor people, on application by a medical practitioner at any hour of the day or night, to the Medical Officer of Health, for curative or immunising purposes. This serum is always on hand at the Health Office, Town Hall, the Isolation Hospital, or in cases of emergency, at the residence of the Medical Officer of Health.

“There is no possible excuse for practitioners not using this invaluable remedy at the earliest moment. Outfits for taking swabs from suspicious throats or noses can just as readily be obtained, but practitioners are strongly urged *not* to wait for a report by telegram of the swab before using antitoxin, but *at once* inject 4,000 units in all suspicious cases, then take a swab and notify provisionally to the Medical Officer of Health.

“*One negative swab is of little value.* Only after two swabs, carefully taken can a negative bacteriological examination be considered of any weight. It is important in these cases to swab the nose. Medical practitioners are strongly urged to use the swabs freely provided, in every case where there is the smallest reason to suspect the presence of diphtheria. *Every sore throat should be considered to be infectious until it is proved not to be so.* Diphtheria may be so slight that the patient complains of but little.

“The role of ‘carrier cases’ is important. It is always to be remembered that persons may be the hosts of virulent diphtheria bacilli, yet themselves present few or no signs of the organism. Such cases among school children are fruitful

sources of school epidemics of diphtheria, and in such cases, it is only by swabbing the throats of all the children present in a suspected school or class that the guilty individual may be detected. I am convinced that the greater use now being made by the doctors of the town of the swabs provided by the Corporation is contributing very largely to the continued diminution of this disease and that the early detection and isolation thus rendered possible are the essential controlling factors."

In STALYBRIDGE 9 cases with 1 death occurred. The question of supplying antitoxin f. o. c. to neecessitous cases was considered by the Sanitary Committee, but they decided not to adopt this measure.

In ALDERLEY EDGE URBAN DISTRICT no cases occurred during 1910.

"Antitoxin is supplied by the District Council, and may be obtained from the Medical Officer of Health. In 1897 the District Council made arrangements with Professor Delépine, of the Public Health Laboratory of Manchester, for the examination of swabs from the throats of suspected cases of diphtheria, and this arrangement has proved very satisfactory."

ALTRINCHAM URBAN DISTRICT had 13 cases of this disease notified, but no special comment on this disease is made by the Medical Officer of Health. The same remark holds good for the LOWER BEBINGTON URBAN DISTRICT, where 15 cases occurred. In HOOLE URBAN DISTRICT 10 cases were notified. The Council keep a supply of antitoxin for use in neecessitous cases.

The Medical Officer of Health for the Urban District of MOTTRAM-IN-LONGDENDALE reports as follows of 2 cases which occurred ;—

"Both cases occurred in Broadbottom, and in each case sanitary defects were found. Whilst on this subject I may mention that there have been a number of cases of ulcerative tonsillitis. These, I think, have been caused by untrapped drains, and smells from ashpits. The Sanitary Inspector and myself went over these infected parts, and where sanitary defects were found, these were ordered to be remedied.

"On the recommendation of the Local Government Board, you very wisely directed the Medical Officer to always keep a supply of antitoxin in hand, so that any of the medical men

in your district could have a supply immediately a case was notified."

IN LYMM URBAN DISTRICT there were 26 cases with 3 deaths during the year. Dr. De Jong reports on these as follows:—

"A widespread epidemic of mumps occurred during the first half of the year. On the 2nd of March we had a solitary case of diphtheria. On the 28th March occurred the first of a series of eighteen cases of diphtheria. Seven of these were notified on the 1st of June, nine on the 3rd June, one on the 4th of June, and one on the 26th of that month. Another solitary case occurred at the end of July; three more cases (two in one household) were notified in the middle of October, and the last case about the middle of November. Of the three deaths from diphtheria that took place two were moribund before being medically attended, and died within a few hours from first being seen. The parents thought their children were ill with mumps, then very prevalent. The third death was one of the three October cases, who died suddenly from heart failure, after the membrane was gone, and the force of the disease seemed spent. Antitoxin was used once or more for all the cases, with results that go undoubtedly to confirm its now recognised and assured value. We had three or four cases of urticaria, about 14 days after injection, owing to its use, and two cases of inflamed hip joint, as shown by pain in the knee, when at rest, and pain and rigidity in the hip joint of the side injected, on movement; in fact they simulated early tubercular hip joint, came on about a fortnight after injection, and passed away entirely after a few days. The injections were made well up in the flank, far away from the hip."

IN NESTON AND PARKGATE URBAN DISTRICT 9 cases were notified, and on these the Medical Officer of Health reports:—

"The diphtheria outbreak was characterised by the mildness of the symptom, although in one instance sudden death took place. Three of the persons attacked were between the ages of 25-65. Your Medical Officer paid a visit to the Church of England School and detected a child actually suffering from the disease, in attendance at the school. The cases were confirmed bacteriologically. You have made provision under the antitoxin order for a supply of diphtheria antitoxin to be made available for the use of poor persons who cannot afford to purchase it for themselves."

IN NORTHWICH URBAN DISTRICT 53 cases occurred, and the Medical Officer observes that:—

“The notifications were often received when the cases were dead, the onset of the disease being sudden and very rapidly fatal, the croup not being preceded by any throat symptoms. Twenty reports were received from Professor Delépine upon swabs from suspected throats, of which 9 were positive and 11 negative. Antitoxin is supplied by the Council free of cost to any person whom they consider unable to pay for it. 160,000 units were supplied for 26 cases.”

IN RUNCORN URBAN DISTRICT:—

“Thirty-eight notifications were received throughout the year, notifying 34 cases of diphtheria and 4 of membranous croup, and affecting 33 houses. Fifty-one notifications were received during the previous year. The cases were pretty evenly distributed over the twelve months of the year, and were not confined to any particular part of the town or area. The Authority will observe that there is a gradual falling away in the notifications of diphtheria. For the year 1910 the notifications of this disease are fewer by 17 cases than those notified for the preceding year.”

IN WALLASEY URBAN DISTRICT there occurred 44 cases, of which number 4 died. The cases were sporadic in occurrence.

IN WINSFORD URBAN DISTRICT only 8 cases occurred in scattered localities and at various times of the year.

IN BUCKLOW RURAL DISTRICT 14 cases occurred, with 1 death. There were no special circumstances in connection with any of these cases.

IN CONGLETON RURAL DISTRICT no fewer than 61 cases were reported: 54 in the Sandbach district, 6 in the Holmes Chapel district, and 1 in the Congleton district. As regards the distribution of the disease in the separate townships 6 were at Mow Cop, 1 at Lawton, 2 at Somerford, 4 at Elworth, 1 at Astbury, 17 at Scholar Green, 2 at Cranage, 2 at Wheelock, 2 at Goostrey, and 23 at Rode Heath. Dr. Bennett adds:—

“In the middle of August a case was notified to me of a child in a canal boat. This child was promptly removed to the hospital, but the brothers and sisters of this child were attending Rode Heath schools at the time, the

parents having their home at Rode Heath, and I believe infected several children at that school, as several cases occurred amongst the scholars. The Medical Officer for the school closed it for six weeks, but cases from the neighbourhood were reported for three months afterwards. I am thankful to say the epidemic was only of a mild type and has now ceased. I myself disinfected the boat. The Sanitary Inspector disinfected the boat as well, but a canal boat is a very difficult place to disinfect, and however well cleansed it is always a cause for anxiety. One more case occurred on this boat in about a month but no more since."

In NANTWICH URBAN DISTRICT 65 cases occurred. Dr. Turner remarks that:—

"There were many cases in which it was difficult to trace directly the source of infection, but I think it will be seen that the cases may be roughly grouped into two classes—(1) those connected with the outbreak of last year in the township of Dodcott-cum-Wilkesley, and (2) those whose infection was probably derived from the Borough of Crewe. Of the 65 cases 33 occurred in the Crewe sub-district and 20 in the Wrenbury sub-district. The cases in the Crewe district occurred in the townships of Barthomley, Church Coppenhall, Willaston, Wistaston, Haslington, Weston, Warmingham and Wybunbury. In the great majority of these outbreaks I was able to trace some connection either by means of school attendance or family visiting between the sufferers and infected persons or places in the Borough of Crewe, in which during the earlier portion of the year there was a considerable outbreak of diphtheria. The cases at Warmingham were 7 in number and occurred in the months of April and May. They were associated with cases in the adjoining portion of the Congleton Rural District, and as school-infection was apparently taking place I obtained the closure of the Warmingham School for a few weeks and had the school premises and furniture disinfected. My action was successful in putting an end to the outbreak. The cases in the Wrenbury sub-district occurred at Dodcott, Newhall, Wilkesley, Audlem, Buerton and Sound. The cases in the first three of these townships I believe to have been echoes of the outbreak at Dodcott, commented upon by me in my last Annual Report.

"I have come to regard diphtheria as being but little if at all caused by what are generally known as insanitary conditions, but as being purely spread by means of personal

infection, the infection being carried in many cases by persons who themselves show no visible signs of illness. It is well known that the bacillus of diphtheria can be found in the throats and noses of a large number of the persons living in the same house as cases of the disease although no sign of illness may be apparent. The occurrence of so many cases in the Borough of Crewe must have meant that in all probability at least three or four times as many persons as were discovered to be suffering from diphtheria must have been carrying about with them the bacilli of the disease, and, being themselves free from any ostensible illness, they could not be discovered and isolated and thus were a very considerable danger to the public health of the surrounding districts."

IN NORTHWICH RURAL DISTRICT 37 cases occurred chiefly during the last quarter of the year. Antitoxin is supplied free of charge by the Council to any suspected case of diphtheria, and 132,000 units were thus supplied to 19 cases during 1910.

IN RUNCORN RURAL DISTRICT there were 23 cases with 1 death. Antitoxin is supplied free of charge to poor patients through our Medical Officer of Health.

The Medical Officer of Health for the WIRRAL RURAL DISTRICT states that this disease was "widespread throughout the entire Wirral Peninsular" during 1910.

Provision of Anti-toxin.—The Local Government Board have issued an Order, dated 15th August, 1910, in the following terms, authorising the free supply of diphtheria anti-toxin by District Councils:—

WHEREAS under Section 133 of the Public Health Act, 1875, any local authority (including the Council of every County Borough, the Council of every Urban District, and the Council of every Rural District) may, with the sanction of the Local Government Board, themselves provide or contract with any person to provide a temporary supply of medicine and medical assistance for the poorer inhabitants of their District;

And whereas it is expedient that, subject as herein-after stated, the sanction of the Local Government Board should be given under the above-cited enactment to the provision by any of the said Councils of a temporary supply of the medicine known and herein-after referred to as "diphtheria anti-toxin," and of medical assistance in connexion with the temporary supply of diphtheria anti-toxin;

And whereas in pursuance of the enactments in that behalf, the Local Government Board by a General Order dated the 23rd day of March, 1891, prescribed in relation to Medical Officers of Health appointed by the Councils of County Boroughs and by the Councils of

Urban Districts, and by another General Order of the same date prescribed in relation to Medical Officers of Health appointed by the Councils of Rural Districts, Regulations with respect to the duties of the said Medical Officers of Health, and also with respect to their salaries in every case in which one-half of the salary of a Medical Officer of Health is intended to be payable by a County Council or by the Council of a County Borough under the Local Government Act, 1888 ;

And whereas, with respect to the said Medical Officers of Health, it is expedient that further provision should be made with regard to the following matters ; that is to say, —

(a) the duties of the said Medical Officers of Health in connexion with the use of diphtheria anti-toxin in cases of disease, as well for the prevention of disease as for the prevention of its extension ; and

(b) the compensation of the said Medical Officers of Health for the discharge of the said duties in every case in which one-half of the salary of a Medical Officer of Health is intended to be payable as aforesaid :

NOW THEREFORE, We, the Local Government Board, in the exercise of Our powers in that behalf, do hereby Order as follows :—

ARTICLE I.—We sanction the provision by the Council of every County Borough, the Council of every Urban District, and the Council of every Rural District, or their contracting with any person for the provision, in pursuance of Section 133 of the Public Health Act, 1875, of a temporary supply of diphtheria anti-toxin, and of medical assistance in connexion with the temporary supply of diphtheria anti-toxin, for the poorer inhabitants of their District, subject to the following condition, that is to say,—

The arrangements with respect to the keeping, distribution, and use of the diphtheria anti-toxin shall be made in accordance with the advice of the Medical Officer of Health.

ARTICLE II.—The duties assigned to the Medical Officer of Health by such one of the two General Orders dated the Twenty-third day of March, One thousand eight hundred and ninety-one, as applies to his case, or other the Regulations for the time being issued by Us and superseding the Regulations prescribed by the said Orders, shall be deemed to extend to and to include all action by the Medical Officer of Health in the execution of this Order.

ARTICLE III.—Where one-half of the salary of a Medical Officer of Health is intended to be payable by a County Council or by the Council of a County Borough under the Local Government Act, 1888, such one of the two General Orders dated the Twenty-third day of March, One thousand eight hundred and ninety-one, as applies to his case, or other the Regulations for the time being issued by Us and superseding the Regulations prescribed by the said Orders, shall apply and have effect as if the Regulations thereby prescribed included a provision authorising the Council of the District, or requiring them at Our direction, to pay from time to time to the Medical Officer of Health, in addition to the salary or other compensation payable under the said Regulations, a reasonable compensation for all action by the Medical Officer of Health in the execution of this Order.

The following circular amplifies the above Order :—

“ I am directed by the Local Government Board to state that they have had under consideration the question of facilitating the prompt use of diphtheria anti-toxin in the case of persons

who may be attacked by diphtheria or exposed to the infection of the disease, and with that object they have made an Order, under section 133 of the Public Health Act, 1875, sanctioning the provision by the Councils of county boroughs, urban districts, and rural districts throughout England and Wales, of a temporary supply of diphtheria anti-toxin and of medical attendance in connection therewith. Copies of the Order are forwarded herewith.

"The arrangements with respect to the keeping, distribution, and use of the diphtheria anti-toxin are to be made in accordance with the advice of the medical officer of health, and having regard to the importance of the matter, I am to suggest that at an early date the Council should consider, with their medical officer of health, what arrangements should be made for the provision of anti-toxin, and for its use both as a prophylactic and a curative agency.

"In cases in which a patient is under the care of a medical practitioner, the latter should, in ordinary circumstances, be the person to administer the anti-toxin. In considering the matter the Council should take into special account the possible requirements of the poor law medical officers, as it appears to the Board to be desirable, where the Council avail themselves of the powers now given them, that the poor law medical officers should be able to obtain from the store of the Council the anti-toxin which they may require from time to time for use in connection with patients under their care.

"To prevent misapprehension it should be observed that the free provision of diphtheria anti-toxin, which is authorised by the Order, must not be regarded as a substitute for removal to hospital of a patient suffering from diphtheria, nor as implying that the patient to whom the anti-toxin has been administered may properly be retained for treatment at home, unless means are available for his efficient isolation to the satisfaction of the medical officer of health.

"The prompt administration of anti-toxin before the patient is removed to hospital may, especially if delay in removal is inevitable, go far towards preventing the attack of diphtheria from being fatal.

"By Article II of the Order the duties of the medical officer of health are to be deemed to extend to and to include all action by the medical officer of health in the execution of the Order, and Article III provides for the payment by the

Council to the medical officer of health of reasonable compensation for such action taken by him.

"The arrangements which the Council may make for the supply of diphtheria anti-toxin should be brought to the knowledge of all medical practitioners practising within their jurisdiction; and in any circular letter which the Council send out to medical practitioners it is desirable that emphasis should be laid on the importance of prompt treatment by anti-toxin and of the saving of life which may thereby be effected."

Enteric or Typhoid Fever.—In the Administrative County there were 235 cases of this disease notified during 1910, viz.:— 89 in the 6 Municipal Boroughs; 121 in the 36 other Urban Districts; and 25 in the 12 Rural Districts. The deaths from this disease numbered 49 during the year.

In CONGLETON BOROUGH there were only five cases notified and Dr. Davidson states that:—

"Of these 5 cases one was suspected of having become infected outside the district, the drainage of the houses where two occurred was defective, and there was not anything found in connection with the others to account for their occurrence. The water-supply to all the houses was good."

In CREWE MUNICIPAL BOROUGH only 12 cases occurred with 5 deaths; five of these cases occurred in one family.

Twenty-four cases with 7 deaths but with no special circumstances accompanying them, occurred in the BOROUGH OF DUKINFIELD.

In HYDE MUNICIPAL BOROUGH 15 cases were reported. Dr. Bennett reports:—

"Four deaths were caused by enteric fever during the year, giving a death-rate of .11 per 1,000. No cases were traced to contaminated water or milk-supply. Of the 15 cases reported 11 were removed to hospital. Pails with airtight covers are supplied to houses which are not on the water carriage system for the reception and removal of typhoid excreta."

In the BOROUGH OF MACCLESFIELD 15 cases were notified and of these 3 died. Dr. Marsh further reports:—

"Forty-one specimens of blood from persons suspected of

suffering from enteric fever were sent by medical practitioners to the Lister Institute—in 17 of these a positive re-action was obtained.

“The gradual decline of enteric fever in the town, during the last few years, is I believe attributable :—

(1st.) To the gradual abolition of the privy midden.

(2nd.) The isolation in hospital of all cases likely to spread infection by direct contact.

(3rd.) The greater use of the Widal test in doubtful cases, and the consequent shortening of the period during which the medical attendant is arriving at a diagnosis, and a consequent lessening of the period which intervenes between the onset of the disease and the taking of precautionary measures to prevent the spread of infection.

“The removal to hospital of persons suffering from enteric fever out of small houses where nursing accommodation is primitive, is followed by a cessation of “direct infection” cases *i.e.*, the ‘nurse’ sickening with the disease acquired by careless and ignorant handling of the patient, his bed, excreta, &c.

“The abolition of the privy-midden certainly reduces the incidence of the disease, since every privy infected by typhoid excreta thrown therein is a vast storehouse of future infection which can be disseminated broadcast as dust and filth whenever it is emptied.”

Eighteen cases occurred in STALYBRIDGE MUNICIPAL BOROUGH, and in reference to these Dr. Hancock reports :—

“We have not a hospital for these cases so that they have had to be treated at home, often under the most disadvantageous conditions, but great precautions to prevent its spread are taken by our Sanitary Authority in providing special pails with disinfectants for the reception of all discharges from the sufferer, in instructing the inmates upon the necessity for strict personal cleanliness of the patient and themselves, as well as for cleanliness of the bed and body linen, in advising the destruction of all food left by the patient, and in the destruction of beds and mattresses which have become much soiled with discharges. The sanitary conveniences of the premises also receive prompt and thorough attention.”

IN NORTHWICH URBAN DISTRICT 7 cases occurred during the first quarter of the year, in close proximity to each other, 3 being in one house. Dr. Gough reports that :—

“The origin of this outbreak was obscure, but energetic measures were taken to abate it; the cesspools and ashbins were disinfected and sewers and gullies flushed with disinfectants. The milk supply was scrutinized carefully, but as the sources of supply were many and irregular it was difficult to be sure of it all, and 2 small retail shops were prohibited from selling milk for a time; a shallow well in a neighbouring district (rural) was chemically and pathologically analysed with negative results. The father of the 3 children from one house who were infected had an attack of diarrhœa; he was out of work and had been tramping about looking for a ‘job’ and was certainly poorly; two samples of his blood were sent for pathological examination with negative results, but I am still of the opinion that he suffered from a very slight attack and was the cause of the epidemic.”

KNUTSFORD URBAN DISTRICT.—Dr. Garstang presents a most interesting report on an outbreak of enteric fever which occurred in this district from June to December, 1910, as well as a report on the same outbreak prepared by Dr. T. L. Fennell, who assisted him in the investigation of the outbreak.

“The year has been marked by the most serious epidemic on record. Two cases occurred in the middle of June; then 9 cases between June 29th and July 4th; 9 more cases later in July; 1 in August, 1 in September, and then 14 about the end of October and beginning of November; concluding with one case in the middle of December. This accounts for the 37 notifications; but there were also two cases just over the boundary (in the Bucklow Rural District) which were a part of the epidemic: one fatal case in the district not notified; and at least 4 more cases were heard of in persons who developed the disease after leaving the district. So that there must have been at least 44 cases; and it is quite possible that others were overlooked. Several were discovered by bacteriological examination of contacts; one girl in particular having not been suspected of illness, as she had never missed a single attendance at school! Early in July I applied to the Council for a special increase of staff, and Dr. T. L. Fennell was formally appointed Assistant Medical Officer of Health, a position which he held until the end of the year. To his enthusiasm, keenness, and perseverance, the district owes the possibility that a complete and reliable record of the

epidemic can be given ; as well as the practical daily application of those preventive measures, which must have been largely effective. Severe as the epidemic was, there were at least two periods when I would not have been surprised if it had been infinitely worse. The County Medical Officer of Health was over as early as July 6th, as well as on a later date ; and Dr. Manby, Medical Inspector of the Local Government Board, came on July 15th, and on very many subsequent dates ; affording most valuable advice and assistance, making numerous inspections, visits, and enquiries, himself, in short, organising our campaign, and bringing our methods up to date. I have asked Dr. Fennell to write a general description of the epidemic, which will be found printed at the end of this Report ; and I desire to acknowledge most fully my own personal indebtedness to him for zealous and loyal assistance.

“One or two points require individual notice.

“*The Public Water Supply.*—This was, I believe, the first suspicion of everybody. As soon however as it became clear that the epidemic was confined to a strictly limited area, the general supply was exonerated ; and there only remained a remote possibility that there might be a local contamination from a leaky joint in polluted ground. This was never proved.

“Moreover, although the water is known to suffer much sewage-pollution in the catchment area, no epidemic has ever been known to arise from it ; which supports the latest scientific view that the typhoid germ, if introduced, would not survive the passage down the stream, and (more particularly) through the large reservoir. So that, although the water is impure, there is little risk of a water-borne epidemic of typhoid.

“*The Area affected.*—By the middle of July there were 7 cases in Silkmill Street, 2 in Market Place, and 3 others. By the end of July there were (in all) 8 in Silkmill Street, 4 in Market Place, 3 in Malt Street (all close together), and 6 others. At the end of the year the numbers were: 21 in Silkmill Street, 5 in Market Place, 3 in Malt Street, and 8 others. Attention was thus concentrated on Silkmill Street from the first. It is a short street in the centre of the town, connecting Princess Street with King Street, and having a considerable fall. The South side, where the old silk mill used to stand, is now mainly occupied by the Infants’ school and playground: and below there is one

new block of three cottages. On the North side there are a few cottages of comparatively recent erection, but most of the buildings are very old. There are 30 houses; most open directly on to the street, but 5 are in narrow alleys, and 4 are in yards behind. Within the last few years several obstructive outbuildings have been pulled down, the surface of the yards concreted, and water-closets provided in place of privies. The street itself is narrow, not being a thoroughfare for vehicles, is paved, has no side-paths, and the water channel with three large grids is in the centre. That the individual condition of each house, sanitary or otherwise, was not an important factor, is shown by the fact that the majority of the cases occurred in the better cottages of most recent erection.

"The Main Sewer.—This has long been suspected to be faulty; and an inspection, ordered by the Council, showed that it was formed, in its lower part, of "butt-ended" pipes with open joints, and in its middle length of obsolete "cannon" pipes. At considerable expense, in November and December, a new sewer was laid, and the house drains properly connected. When opened up, it was found that there were open joints in the old sewer, anything up to three inches in extent; and not a single house-drain was properly connected.

"The new sewer is of course properly ventilated; the old one was ventilated by the rain-water down-spouts, a plan which I had previously condemned. Whether it be anything more than a coincidence it is impossible to say, but it is a fact that there have been no further cases in this street since November 2nd (the work on the sewer began November 28th).

"Articles of Food.—The milk-supply received repeated investigation with painstaking detail, without result. Some of the patients took no milk, or very little, and in the supply of the rest every dealer in the town was concerned. Shell-fish and water-cress had not been consumed. Ice-cream was supplied by an itinerant vendor from Northwich, but there was no enteric among his customers at home. Home-brewed "herb-beer" was made at one cottage in the street, but repeated inspections both of premises and utensils gave no clue. The same may be said with regard to fried fish and chips. Ordinary mineral waters were not consumed.

"The First Case?—This was never discovered. Every medical practitioner in the town unanimously declared his

experience that Silkmill Street was notorious for the persistent existence of cases of a vague and indefinite febrile character; and that this had been so for many years. During a house-to-house inspection Dr. Fennell found two houses which were being used as common lodging-houses (though unregistered), and it is quite possible that the mischief was introduced by some person who made a brief stay in one of these houses about the middle of May. Most of the cases could of course be explained by personal contact with the earlier ones; but it is also very remarkable that when a systematic test was applied to those in contact with known cases, no less than six were discovered to be sufferers who had not been suspected by any one, lay or professional.

“Carriers.”—Dr. Manby’s investigations were largely directed to the discovery of “carriers,” though none were found. It is now established and accepted that 2 or 3 per cent. of persons recovering from enteric fever continue intermittently for months or even years to excrete the typhoid germs from their bowels or kidneys; such are obviously “carriers” of infection when believed to be harmless. This fact is likely to cause a considerable alteration of opinion as to the danger from water, or milk, or sewers, or any of the things which have heretofore constituted the list among whose items a first cause was sought.

Dr. Fennell’s Report is as follows:—

“The second half of the year 1910 was characterised by the most serious epidemic of enteric fever which has visited the township of Knutsford within the memory of man. The epidemic naturally divided itself into two phases, the first extending from 6th June to 20th August, the second from a notification on 16th September to the end of the year (and even continuing into the early weeks of January, 1911).

“The first notification received was that of E.B. (25) on 16th June, followed by P.D. (7) on the same date, A.C. (9), J.C. (10), E.C. (13), on 29th June, and Agnes C. (33) on 2nd July, four of these latter cases occurring in one house.

“It was evident from this group of notifications that the disease was present in the town in an epidemic condition, and as the cases so far investigated were not of a very typical nature, in their early stages at any rate, the attention of the medical men in the town was drawn to the

possibility of other cases being unrecognised, and this resulted in the notification of J.F. (12), P.F. (8), on 2nd July, H.C. (9), E.J. (7), R.S. (28), on 4th July, S.H. (25) on 5th July, J.J. (39) on 14th July. Up to this point the incidence of the disease had been more marked amongst children than amongst adults, and had occurred in a comparatively small area of the town and amongst the poorer classes of the inhabitants. Investigation of the water-supply, milk, and food stuffs was immediately instituted, and after long and careful enquiry, the source of the epidemic could not be attributed to any of them. Evidence of direct contact was established between the majority of these cases and the others could be indirectly connected to them.

“The origin of the outbreak was most obscure. It was at first thought that it might have been started by an undetected slight case lodging in one of the several unauthorised lodging-houses in the locality, but bacteriological examination brought to light the fact that a child, M.A., who had been seriously ill over twelve months ago, now gave positive evidence of having suffered from enteric fever. So with this case in view it was thought to be likely that others also had been going about in an infectious state, and that the epidemic had existed in a mild and unrecognised form for some time prior to the first notification. Several medical men volunteered the information that they had been conscious of an ill-defined type of illness, especially amongst children, for some years past, and that this had been more prevalent in Silkmill Street than in any other part of the town. A reference to Table II. will show that this street also was the focus of the present epidemic, and a reference to previous Health Reports shows this street to have been visited by enteric fever to a greater extent than any other part of the town.

“The attention of the public and the medical men of the town having been again drawn to the seriousness of the condition, a further batch of notifications was forthcoming: M.H. (12) on 19th July, T.H. (15) on 20th July, L.B. (12), J.W.L. (23) on 20th July, E.B. (17) on 22nd July, M.H. (27) on 27th July, S.A. (11) on 8th August, and M.A., already referred to.

“In the majority of these cases also satisfactory contact was established.

“A curious and somewhat disquieting feature of several of these cases was the fact that they were so slightly indisposed that they were never away from work or from school

for a single half-day. Another factor which may have contributed to the spread of the disease was the fact that several of the cases were treated at home, and not removed to hospital, and also that the disinfection of infected houses was not in every case carried out as thoroughly as the importance of the situation demanded. The first phase of the epidemic was ended by an outbreak at a girls' school in the town. Although only one case was notified to the Knutsford Authority, H.R. (22) on 20th August, one other died near Rochdale of enteric fever during August, and two other occupants almost certainly suffered from the disease immediately after leaving the school and the district. Although these two latter cases were never bacteriologically verified, I have no hesitation in counting them as cases in this epidemic, and so have included them in Table II. Direct evidence of infection could not be obtained, so it can only be assumed that it was carried to the school by one of the maids, or perhaps more probably by a casual charwoman.

"The possible existence of a "carrier" or "carriers" was not forgotten in the etiological investigation, and bacteriological examinations were made of a large number of specimens of urine and fæces collected from those who were known to have previously suffered from enteric fever, to have suffered from illnesses of an obscure or uncertain type, persons known to have been in intimate contact with cases that arose, and convalescents. Although the search for a carrier was continued up to the close of the year, no such infectious person was discovered, but, unless the whole community was systematically examined, it would be impossible to say that none such existed. In very many of the cases considerable time intervened between the onset and the notification of the disease, the mildness of symptoms in most cases perhaps accounting for this, but in several, at any rate, there was neglect of the parents in calling in a medical man in the early stages of the illness. These reasons, along with those already mentioned, contributed largely to the continuance of the epidemic.

"The vigilance of everyone concerned was becoming relaxed, when on 16th September another case was notified—A.J. (34), living in a previously infected house. A month later there was a definite recrudescence. F.W. (22) on 14th October, E.J. (16) on 16th October, W.C. (14) on 24th October, T.C. (40), M.G. (25), F.C. (4) on 27th October, A.F. (26), L.W. (24) on 28th October, H.J. (13), G.P. (25) on 29th October, J.W. (22), E.F. (10), M.C. (24) on 2nd

November, E.B. (7) on 11th November, and H.R. (14) on 15th December. The very great majority of these cases occurred in Silkmill Street, and in the few arising in other localities, direct contact with houses in this street was established. The fact that A.J. and F.W. were nursed at home and not sent to hospital was a great factor in this second outbreak. Ten of this latter group of cases were residents in houses situated at the lower end of Silkmill Street. Some of these houses were provided with pail closets, and flies being especially prevalent during the month of October, a reasonable means of transmission can thus be established for this group.

"In addition to the above-mentioned cases, a child J.C. (7) died in the house occupied by the case M.C. on 8th December, without receiving medical attention, and a post-mortem examination revealed the fact that the cause of death was the perforation of a typhoid ulcer.

"A further case was notified to the Rural Authority, L.K. (16), on 28th November, and direct contact with a previous case was with some difficulty traced, and another, C.V. (25), working at a Public Laundry in the town, was taken ill on the 13th October and eventually notified to the Northwich Urban Council. In this latter case no direct contact could be discovered, but it is only reasonable to suppose that the disease was contracted in Knutsford. This second section of the outbreak did little to elucidate the original cause, but the repeated cases in the same area and in many of the same houses continued to point to some lack of care in disinfection, and possibly to the fact that some of the cases were returned from hospital in a still infectious state.

"The enquiries necessary in attempting to trace the source of the epidemic entailed an enormous number of visits and interviews with people of all classes either closely or remotely connected with those attacked, but the information gained was chiefly of a negative character.

"*Water*—As water alone was common to all the cases, it naturally attracted early attention. Although the source of the supply is far from satisfactory, bacteriological examination failed to detect any specific impurity, and a thorough examination of the courses of the brooks forming the supply brought to light no evidence of contamination likely to give origin to the epidemic. The circumscribed area involved was also against a water-borne epidemic.

"Milk—All the farms supplying milk to the houses involved were repeatedly visited and no case of sickness detected at any of them. The retail dealers were also carefully looked after and nobody concerned in the distribution of the milk was found to be involved, except one small boy whose brother was found to have suffered from the disease. However, the retailer employing this lad was found to have supplied comparatively few of the houses concerned. In some of the houses practically no milk at all was used.

"Ice Cream—There was no evidence to incriminate the ice cream supplied.

"Shell Fish—Hardly ever eaten.

"Herb Beer—Herb beer, manufactured by an old woman living in Silkmill Street, was used by the majority of those infected. No case, however, occurred in her house, and the woman and a daughter who lived with her were submitted to bacteriological examination with negative results.

"Fish and Chips were largely taken. The shops supplying these food-stuffs were carefully examined. In every case the business was carried on in a clean and satisfactory manner, and the food supplied was good and wholesome.

"Water-cress and other uncooked Vegetables were very little used.

"Sanitary Arrangements—Owing to repeated complaints by the residents in Silkmill Street of bad smells arising from the grids, an examination of the sewer was undertaken. It was found to be of an obsolete and dangerous type, being composed of a miscellaneous collection of pipes of different sizes and shapes, largely unjointed, and ventilated in rudimentary fashion by means of the down-spouts. Not a single connection with this sewer could be classed as satisfactory. Its renewal was decided upon, and this work, supervised by a skilled Sanitary Engineer, was completed by the end of the year. I understand that action is to be taken to have all other drains in this street, many of which were of an almost prehistoric kind, put in order, the remaining pail-closets replaced by water-closets, and a few ashpits which still exist removed.

"During the enquiry attention was drawn to sanitary defects in other parts of the town, but it is hardly within the scope of this report to go into details.

*“Lodging-houses—*Two houses in Silkmill Street, as well as a few in other parts of the town, were found to be used as unauthorised common lodging-houses. Such houses are always liable to be a source of danger.

It is disappointing to have to report, at the end of six months work, that no definite conclusion has been arrived at as to the original source of the outbreak. It is not my intention to indulge in theories, but to submit this report as a statement of simple fact and as an indication of the scope and extent of the enquiry that took place.

“For a large part of the period I had the pleasure of assisting Dr. E. P. Manby, Local Government Board Inspector, in his investigations, and I am deeply grateful to him for his encouragement and the fund of knowledge he always placed at my disposal. To Dr. T. W. H. Garstang, Medical Officer of Health, I owe, in the first place, the privilege of being able to submit this report, and throughout have been indebted to him for his kindness and assistance. To the inhabitants of Knutsford, who, with few exceptions, were ever ready to provide any information in their power, I also desire to record my thanks.”

In RUNCORN URBAN DISTRICT forty-two cases were notified during the year. Dr. MacDougall reports that :—

“Thirty-seven houses were affected. Nineteen cases of typhoid fever and eighteen cases of continued fever were notified from an area surrounding a fish yard, and within a radius at the outside of one hundred and fifty yards to the suspected spot. This spot formed the centre of what appears to have been the zone of danger. As soon as the condition of this very much neglected large yard was discovered, steps were immediately taken to have it cleaned and cleared of all decomposing and festering matter, thoroughly disinfected, and closed. It was a regular breeding place for flies, and there they were in myriads, invading all the houses for a considerable distance round the plague spot. The flies were no doubt the carriers of evil to the homes of the unsuspecting people.”

In the WALLASEY URBAN DISTRICT Dr. Barlow reports that :—

“The number of cases of typhoid notified was 14, compared with 18 in 1909. Three of these were found on observation not to be typhoid, and 4 were contracted outside the district. None of them had eaten shell-fish. The drop in the number of notifications of typhoid in recent years is very

remarkable. I ought to mention that the drop is not confined to Wallasey. I think it can be truthfully said that typhoid is a disease which is rapidly disappearing in England. The cases admitted to hospital were of a peculiarly severe type, as is shown by the fact that of the 7 cases admitted 5 died."

In the BUCKLOW RURAL DISTRICT there were 6 cases with 1 death. Dr. Garstang adds:—

"A fatal case in Tabley Inferior in July, and a case in Tatton in November, were part of the Knutsford epidemic. A case removed to Monsall from Northenden in August was there diagnosed as pneumonia, and the death has been so classified. A case in Plumbley was bacteriologically negatived. A case in Northenden in July and one in Dunham Massey in August were both imported. The Bucklow District therefore had no enteric fever of its own.

"Reverting for a moment to the epidemic in 1909 at the David Lewis Homes, a suggestion as to the missing link in the history given in my last Annual Report, may possibly be found in this year's discussion of the Knutsford epidemic. Much greater attention is now being paid to the discovery of "carrier" cases; and it seems to be possible for a carrier to be actively dangerous, and yet give no evidence when tested in the usual way (Widal). All persons connected with the dairy were tested in this way; we have only to assume that one of them was nevertheless a carrier, and the whole mystery disappears. Such cases can only be proved by repeated examinations of their excreta; and this method was not adopted in 1909, having not at that time become sufficiently well known."

In NANTWICH RURAL DISTRICT, Dr. Turner states:—

"Two cases were reported, one at Poole in June and one at the workhouse infirmary in November.

"The case at Poole occurred in a young man employed as a motor-car driver. He had been on several long journeys before his illness and had partaken of food and drink at various places during these journeys. It seems clear that he was infected away from home.

"The case at the workhouse infirmary was that of a young man who came into the workhouse from Crewe Borough, suffering from a complaint which was thought to be pneumonia, but which was found by the Workhouse Medical Officer to be enteric

fever. He was removed to our Isolation Hospital, where he died."

Nothing of moment appears in the other Annual Reports under this heading.

Puerperal Fever.—There were 45 cases of this disease notified in the County Area and the following districts appear to have had more than their share of cases. Altrincham Urban District (3 cases) Bredbury and Romiley Urban District (4 cases) and Middlewich Urban District (4 cases). This, of course, has probably been more or less accidental.

In the BOROUGH OF CONGLETON one case only occurred, but the circumstances were somewhat unusual. Dr. Davidson reports on it as follows :—

"The case of puerperal septicæmia was attended by one of the registered midwives, who admitted her patient had been seriously ill from immediately after the birth till she ceased to attend her 10 days later, and that yet she had not insisted on a medical man being sent for. An inquest was held and she was censured by the jury for neglecting to do her duty and for having failed to comply with the rules of the Central Midwives' Board. The case was reported to the County Medical Officer, and, after investigation, sent in by him to the Central Midwives' Board, who severely censured and cautioned the midwife. This midwife attended a large number of cases each year since she was registered and conducted them satisfactorily, and the Deputy Supervising Officer on more than one occasion complimented her on the excellent manner in which she recorded her cases, kept her bag, and complied with all the regulations."

In HYDE MUNICIPAL BOROUGH 3 cases were reported but no special circumstances occurred in connection with them.

In the BOROUGH OF MACCLESFIELD 4 cases were notified, all of which were non-fatal. Dr. Marsh appended the following note on the practice adopted in that Borough in connection with puerperal fever cases :—

"When a case of puerperal fever is reported, the attending midwife is required to cease attendance on other lying-in cases until thorough disinfection has been accomplished. She is required to attend at the Isolation Hospital and there is given a hot bath, and her person, hands, hair and finger nails,

thoroughly cleansed with soap and hot water, steam disinfection of personal clothing, and sterilising by boiling water of all instruments and appliances is carried out, the bag is sprayed inside and out with a 3 per cent. formalin solution, and a clean lining substituted for the old one."

IN WINSFORD URBAN DISTRICT Dr. Garstang reports that :—

"Only 1 case was notified (December 19th); this occurred in the practice of a midwife, just at the close of the customary ten days attendance; the patient recovered. This midwife had a (fatal) case in November, 1907, a (fatal) case in May, 1908, and a case in June, 1908; all visited and enquired into by the County Medical Officer of Health. She had a case also in February, 1909; so that her record is a bad one."

The other reports contain no statements out of the ordinary in connection with this disease.

Cerebro-spinal Meningitis. -- Allusion to this disease is only made in one or two reports.

IN MACCLESFIELD MUNICIPAL BOROUGH Dr. Marsh reports one case :—

"This patient, a boy of 8 years, was received from the Infirmary. He had well-marked symptoms of cerebro-spinal meningitis, a few papular spots, herpes around mouth, &c. The fluid obtained by lumbar puncture was sent to the Lister Institute and reported as containing the diplococcus intracellularis. The treatment was intra-spinal injection of anti-meningococcic serum by lumbar puncture, 8 injections of 10 c.c., each were given of the Lister Institute serum and great improvement followed each injection with ultimate complete restoration to health."

Dr. Garstang for the WINSFORD URBAN DISTRICT states that :—

"One case was notified on October 4th. It was very fully and carefully enquired into the following day by Dr Fennell (Assistant Medical Officer of Health, Knutsford) on my behalf; and was closely watched for a fortnight. We came to the conclusion that although undoubtedly there was meningitis, it was probably not 'cerebro-spinal.' The medical practitioner who attended, still maintains his opinion that his diagnosis was

correct ; and of course no disrespect is intended or involved in our retaining also our opinion."

IN HOYLAKES AND WEST KIRBY URBAN DISTRICT one case of this disease occurred, the statement of the Medical Officer of Health being as follows :—

"On the 14th of July a case of cerebro-spinal meningitis was notified. The patient was a girl visitor from Burnley, who came here on July 9th and was ill at the time. She died on July 15th. Special precautions were taken as to disinfection, etc."

Pulmonary Phthisis.—The action taken under the recent Regulations of the Local Government Board relating to notification of pulmonary phthisis is the subject of report by most Medical Officers of Health, and a few extracts are given shewing the action which is being taken.

In the BOROUGH OF CONGLETON it is stated that—

"Six notifications of phthisis were received from the Union Medical Officer, and all were visited and advised as to the use of disinfectants and the desirability of isolation as far as possible. There was one death, and the house where it occurred was disinfected."

MACCLESFIELD MUNICIPAL BOROUGH—

"Thirty-five notifications relating to 25 persons have been received, viz. :—on Form A, 21 notifications ; on Form B, 6 ; and on Form C, 8. In each instance the address given was visited, full particulars obtained, and instructions given as to the precautions to be taken to prevent the spread of the disease. In two cases the patient was admitted to the Workhouse from outside the Borough, two were said not to have stayed at the address they had stated, and two had stayed at common lodging-houses. The house and bedding were disinfected in nine cases after the patients' removal to the Workhouse, in three on the receipt of the notification, and in three after the death of the patient. In six cases the relations had destroyed the bed and bedding and cleansed the house throughout."

Dr. Marsh further observes :—

"A human being's life is of its greatest value between the age periods of 25 to 65 years, and during this period consumption of the lungs causes no less than 14 per cent. of all the

deaths recorded. The money value loss to the town is thus at a maximum since phthisis takes its toll of life at a period when, economically and socially, such lives can least well be spared. It is surely the height of folly to ignore or pass over such indisputable facts. I am pleased to state that whilst this Report was in preparation, the Town Council, on the initiative of the Mayor, have decided to open the Hospital on the Moss as a Sanatorium for cases of phthisis. I trust to be able to furnish fuller particulars of the work done in my next Annual Report."

In the BOROUGH OF STALYBRIDGE the Medical Officer of Health states that :—

"Notification of cases of pulmonary tuberculosis except under the Public Health (Tuberculosis) Regulations, 1908, is not in force in our Borough, but I furnish the Sanitary Inspector with a weekly return of any deaths registered as due to pulmonary tuberculosis, so that he may visit and ask permission to disinfect any bedding and rooms used by the sufferer, and as a rule the friends are most willing to allow these precautions to be taken.

"Under the Public Health (Tuberculosis) Regulations, 1908, all cases of pulmonary tuberculosis occurring amongst poor persons, who are in receipt of either indoor or outdoor relief, must be notified by a Poor Law Officer to the Medical Officer of Health, and during the year 31 notifications have been received, 19 of which were from the Medical Officer of the Workhouse and 12 from the two District Medical Officers for Stalybridge. These 31 notifications had reference to only 15 persons, some of whom were notified several times. Of these 15 persons 13 were inmates of the Workhouse either permanently or temporarily, while 2 resided in various parts of the Borough and were not admitted into the Workhouse. When a person resident in the Borough is notified as suffering from pulmonary tuberculosis full enquiries are made regarding the premises as well as the inmates, a handbill of instructions is left with the sufferer, and the inmates are advised to have the premises periodically disinfected by the Sanitary Authority."

In HIGHER BEBINGTON URBAN DISTRICT it is stated that :—

"No notification was received of any case of tuberculosis under the Tuberculosis Regulations, 1908. Infirmaries accommodation is provided for advanced cases by the Wirral Board of Guardians, who have also recently built a sanatorium for

earlier cases. Patients whose position does not require poor law assistance are received at the Liverpool Sanatorium in Delamere Forest."

Dr. Cant reports as to the BREDBURY AND ROMILEY URBAN DISTRICT that :—

"Only the poor law notification is in force in this district. I made an attempt to get general notification adopted, and the District Council passed a resolution to add phthisis to our list of notifiable diseases, but on applying for sanction to the Local Government Board we received a letter, informing us that some scheme was shortly being put forward which would render it unnecessary for us to proceed with our plan.

"All cases coming to the knowledge of the Medical Officer of Health are treated as contagious, and instructions given with a view to educating those concerned, in the dangers to others, if care be not taken. Should a case terminate fatally, the rooms, etc., are disinfected, as after the notifiable diseases. Through the courtesy of our registrar, we now get immediate intimation of deaths from phthisis, and are able to carry out the disinfection without loss of time. Unfortunately there are no means of isolating patients in the early stages, except the Workhouse Hospital and public sanatoria, and it is always difficult to get persons in without delay. I should be glad to hear of places where patients in the early stages could go both for isolation, treatment, and instruction as to how to adapt their own homes and habits on return to the healthier methods practised at the sanatoria."

In the URBAN DISTRICT OF ELLESMERE PORT AND WHITBY it is reported that :—

"Under the Tuberculosis Regulations, 1908, six poor persons suffering from pulmonary tuberculosis were notified. They were all admitted to, and treated at the sanatorium provided by the Poor Law Authority, at Clatterbridge. One died, one is still under treatment, and four were discharged in such a state of health that they would be able to earn their own livings. Two other cases died in Clatterbridge in 1910, who had been admitted from Ellesmere Port in the previous year.

"A total of 14 persons, belonging to your district, died from pulmonary tuberculosis or other forms of tubercular disease in 1910, as contrasted with 10 in 1909, and 9 in 1908. It is noticeable that out of the 14 deaths 6 were those of adu

females, who presumably had received neither hospital nor sanatorium treatment. During the last two years I have been able to go fully into the histories of men who applied for treatment at Clatterbridge, and in almost every instance have found that the disease was known to be present, prior to the patient taking up residence in Ellesmere Port."

IN HOLLINGWORTH URBAN DISTRICT:—

"Five deaths from tuberculous diseases were registered, viz.:—

- 4 Pulmonary tuberculosis, and
- 1 Tuberculous peritonitis.

The Council has not yet adopted any system of notification of tuberculosis.

"So far as the poor law is concerned, Hollingworth, as the No. 8 district of the Ashton-under-Lyne Union, is under the Public Health (Tuberculosis) Regulations, 1908. Under those regulations only one case has as yet been notified in this district. This case died at home, and is included in the five cases herein classified.

"Sanitary inspection of phthisical patients' houses has been performed, and the Nuisance Inspector has fumigated after such a death. Advice as to spitting is also given."

IN HOYLAKE AND WEST KIRBY URBAN DISTRICT:—

"Two cases were notified under the Tuberculosis Regulations, 1908, and both were removed to the sanatorium in connection with the Wirral Union, and the rooms vacated were disinfected.

"There is no voluntary system of notification in operation, but on the occurrence of a death or of a removal of a case of pulmonary tuberculosis, premises and bedding are disinfected free of cost, when application is made either by the medical practitioner or by the householder."

IN the NESTON AND PARKGATE URBAN DISTRICT no cases were notified, but Dr. Yeoman reports that:—

"Seven deaths from pulmonary and other tuberculous diseases were registered during the year. This is a very considerable number when one regards the general character

of the district, and I have no doubt but that admission of light and air to the old cottage property as contemplated by you, will lessen the incidence of this disease.

“Hospital accommodation for advanced cases is available at the Clatterbridge Infirmary of the Wirral Board of Guardians, who have also recently erected an open air sanatorium for earlier cases. Use of the Liverpool Sanatorium in Delamere Forest has also been made by early cases, and there have been good results, during the last few years. The generosity of a private individual in your district has made this sanatorium available for a number of sufferers who otherwise could not have afforded to undergo the treatment.”

IN NORTHWICH URBAN DISTRICT two cases were notified:—

“Disinfection of houses is practised when a case is notified, when a death is registered and whenever requested. Sanitary inspection of houses is also made under these circumstances, and patients and their friends advised as to the importance of fresh air, and the avoidance of spitting, &c.”

The system in force in the WALLASEY URBAN DISTRICT and the results of special inquiries are given in a previous section of this report.

IN WILMSLOW URBAN DISTRICT it is reported that:—

“Three cases were notified: two residing in the district, and a third after removal to Knutsford Workhouse. The houses are inspected, advice given, and disinfection carried out when necessary. The only hospital accommodation for advanced cases of the disease is in the Union Workhouse Infirmary. Early cases have been treated at the Manchester Consumption Hospital, but the Council has no arrangement with the hospital. The hospital provides sanatorium treatment at Bowdon and Delamere.”

SECTION IV.—Administration.

Isolation Hospitals.—The hospital accommodation for infectious disease, including small-pox, which exists at the present time in the Administrative County, is as follows:—

Altrincham Urban District—On January 18th, 1910, a new isolation hospital was opened at Sinderland Road, Altrincham. The following is taken from the descriptive souvenir published by the Council on this occasion:—

The hospital is situated on the south side of Sinderland Road, about half a mile from the Manchester Road, and the buildings and grounds cover an area of four acres. The site was purchased by the Council from the Earl of Stamford.

The buildings are on the pavilion system, and provide for the simultaneous treatment of scarlatina, typhoid, and diphtheria. There is accommodation on the site for further extensions when required.

The administrative block is a three storey building, and is the private residence for the matron and nurses. It contains on the ground floor private rooms for the medical superintendent, the matron, and the nurses. On the first floor are the matron's and nurses' bedrooms, bathroom, and store-room. The second floor contains the servants' bedrooms, box rooms, &c.

The scarlatina block is built in four different wards. Two wards contain nine beds each, and two separation wards of one bed each. There is a duty room in the centre of the four wards which gives the nurse full observation of all patients. At the end of the two large wards are the receiving rooms, containing bath, &c.

The typhoid block is separated from the scarlatina block by a glass covered way, and is built in two wards, containing three beds and two beds respectively; in the centre of the two wards are the duty room, receiving room, and pantry.

The diphtheria block is also built in two separate wards containing the same number of beds as the typhoid wards, and arranged in a similar manner; this block also contains an operation room.

The observation block contains two separate wards with one bed each, together with duty room in the centre. Patients will be placed in these wards when any doubt exists as to the disease from which they are suffering.

The out-bathing block will be used for the discharging of patients, and is built near the entrance gate. It contains three rooms: disrobing room, bath-room, and dressing room.

The laundry is fitted with power, and contains a receiving room, wash-house fitted with modern washer, wash tubs, hydro, mangle, clothes bins, and steeping tanks; also drying closet, ironing room, engine house, disinfecting room, boiler house containing incinerator for destroying old clothing, &c. The mortuary and ambulance house are also in this block.

The porter's lodge contains living room, sitting room, pantry, and scullery on the ground floor; two bedrooms and bathroom on the first floor.

A play room has been erected in the grounds for the use of children during the period of convalescence.

The whole of the work has been carried out from the designs of the late Mr. William Owen, A.R.I.B.A., of Manchester, on the decease of whom the Altrincham Urban District Council selected Messrs. J. T. Ashton, M.S.A., and Son, Architects, of Altrincham, to carry through the completion of the work, which has cost approximately £12,000. This sum includes the purchase of land, erection of buildings and boundary wall, furnishing, laying out grounds, &c.

Bucklow Rural District and Alderley Edge, Ashton-upon-Mersey, Hale, Knutsford, Sale and Wilmslow Urban Districts—45 beds in the Manchester Corporation (Baguley and Monsall) hospitals for infectious diseases, other than small-pox, and 10 beds for small-pox.

Congleton Rural District, Congleton Municipal Borough, and Alsager, Buglawton, and Sandbach Urban Districts—A temporary hospital for small-pox at Arclid. The Congleton Joint Hospital Board have recently completed a modern hospital at West Heath, near the Borough of Congleton.

Crewe Municipal Borough—Crewe Isolation Hospital, to which a pavilion for diphtheria was added a few years ago, and a small farm house and corrugated iron building for small-pox cases. Revolving shelter for phthisis.

Hyde Municipal Borough—Hyde Isolation Hospital, completed in 1905, and a temporary hospital for small-pox. The County Medical Officer of Health was compelled recently to draw attention to the state of the walls, ceilings, paint work, &c., of this hospital, but the Council took the matter in hand and it is understood that everything necessary has been carried out.

Hollingworth and Mottram Urban Districts and Tintwistle Rural District—A temporary hospital.

Lymm Urban District—A new hospital erected in 1904.

Macclesfield Municipal Borough—A hospital, which is in part permanent and in part temporary, and another for small-pox. Two cottages were purchased in 1904 for isolating small-pox "contacts" and "suspects."

Macclesfield Rural District—A temporary hospital for small-pox. Arrangements are made for the use of 14 beds in Macclesfield Borough Isolation Hospital.

Nantwich Rural District and Nantwich Urban District—A new hospital was opened on October 11th, 1906. It provides 20 beds for patients, and is situated at Worleston. There is also a temporary hospital for small-pox at Ravensmoor.

Northwich Rural District and Northwich, Winsford and Middlewich Urban Districts—A new hospital was completed in 1905. Northwich Rural District some time since provided a temporary hospital at Marbury which is now used for small-pox, since other diseases are isolated at Davenham Hospital. Northwich Urban District and Winsford Urban District have each provided a temporary hospital.

Runcorn Rural District—A new isolation hospital was completed in 1905. There is also a hospital for small-pox at Moore. Plans have recently been approved and a Local Government Board inquiry held for an extension of this hospital by the building of a large new block for scarlet fever cases.

Runcorn Urban District—Runcorn Isolation Hospital (Weston Road) with 12 beds: only one disease can be treated here at one time. No provision for small-pox (*vide infra*).

Wallasey Urban District—Wallasey Isolation Hospital, lately enlarged, and temporary hospital for small-pox.

Wirral Rural District and Higher Bebington, Lower Bebington, Bromborough, Ellesmere Port and Whitby, Neston and Parkgate, Hoylake and West Kirby Urban Districts use the Spital Hospital, to which a new pavilion was added a short time ago. A hospital at Greasby is available for small-pox.

The Joint Hospital for the use of the Borough of Congleton, Congleton Rural District, Alsager, Buglawton and Sandbach Urban Districts is now in excellent working order.

Crewe Isolation Hospital has maintained its good reputation for useful work. The Report of the Medical Officer of Health contains a complete statement of income and expenditure relating to this hospital for the current year, which will doubtless be of considerable assistance to Authorities about to embark upon the construction of an Isolation Hospital, as well as being useful for comparative purposes as regards cost of upkeep, &c., to existing hospitals.

The Borough of Dukinfield is not provided with an Isolation Hospital of its own, but has an arrangement with the Borough of Hyde for 4 beds, 2 for small-pox and 2 for other infectious cases. It is stated that there has never been any difficulty in arranging for more cases to be admitted. All small-pox cases are sent to hospital, and cases of other infectious diseases are sent at the discretion of the local authority.

In the Isolation Hospital belonging to the Borough of Macclesfield, certain beds are reserved for neighbouring Authorities as follows:—2 in the Small-pox Hospital, reserved for Bollington; 14 in the General Isolation Hospital, reserved for Macclesfield Rural District; and 4 beds in the General Isolation Hospital reserved for Bollington Urban District. This leaves only 22 beds for the Borough in the General Hospital and 10 in the Small-pox Hospital. The total population of the districts served by these two hospitals is, including the Borough of Macclesfield, 56,545. As there are only 52 beds in the Small-pox and General Isolation Hospital taken together, it is clear that the accommodation provided is too

little. Moreover, 12 out of the 52 beds are in the Ducker Hospital, which is a very old pavilion, and not as well adapted as it should be for the treatment of patients.

Of the work done in these hospitals during 1910, Dr. Marsh reports as follows:—

“313 patients were in hospital 12,439 days, an average of 39.7 days per patient, as compared with 44.2 days last year.

“The nurses and maids were in hospital 5,394 days. This gives a total number of days in hospital of patients, nurses and maids of 17,833, and the cost per day for patient, nurse and maid as $8\frac{1}{4}$ d. ; last year the cost was $8\frac{1}{2}$ d., and the year before $9\frac{1}{2}$ d. per day.

“This staff is none too large, as the number of patients is practically never below 30 and may consist of persons suffering from different diseases who need isolating and separate nursing.

“I again have to regret that no progress has been made in the demolition of the old Ducker Hospital, nor in the provision of a building for use as an observation ward—the need for which I called attention to last year. The laundry is now unsuitable and much too small to properly do the work it is called upon to carry out. I do wish the Health Committee would face the position and abolish the now obsolete Ducker Hospital, and provide a new building similar somewhat to the last erected structure, and at the same time erect a new laundry and a small building of two wards for an observation block. These requirements are not unreasonable and cannot but commend themselves to all who wish the hospital to be efficiently carried on. Although the water-supply to the hospital is sufficient for ordinary domestic purposes, the pressure is insufficient in case of fire. We are provided with a number of hand grenades, but it is necessary that extra pressure from the main should be obtained as soon as possible.

“The accommodation provided is too small, if we take the generally accepted standard of one bed per thousand of population. I consider that the time has finally arrived when additional accommodation is needed, and this could be well provided on the site at present occupied by the worn out and unsuitable old Ducker Hospital, which was originally erected in 1887 to meet a sudden outbreak of small-pox.

"The total income received from various Authorities as retaining fees, nursing fees, &c., was £773 12s. 5d., against £785 4s. 8d. received last year.

"I strongly recommend the Health Committee on the earliest possible occasion to increase the accommodation at the hospital by erecting a new set of wards on the site of the old Ducker Hospital.

2nd—To replace the present inadequate laundry accommodation with a suitable up-to-date laundry.

3rd—To improve the grounds and roads leading to the hospital, which are neglected and an eyesore, and could be made a credit to the town."

The Hyde Infectious Diseases Hospital receives patients from a considerable number of districts, and appears to be running a risk of cramping the accommodation which should be reserved for its own population.

During 1910 there were 97 cases from the Borough of Hyde treated in this hospital, and the following is a list of cases admitted from other districts:—

District.	Scarlet Fever.	Enteric Fever.	Diphtheria.
Droylsden ...	3	1	1
Dukinfield ...	0	0	1
Denton ...	2	2	2
Romiley and Bredbury ...	4	0	1
Audenshaw ...	4	1	0
Compstall ...	2	0	0
Marple ...	4	0	0
Disley ...	4	0	0
	—	—	—
	23	4	5
	—	—	—

The Medical Officer of Health for Stalybridge, remarks:—

"Unfortunately we are still without Isolation Hospital accommodation for infectious diseases other than small-pox. For small-pox we are sufficiently provided, along with the neighbouring Authorities of Ashton-under-Lyne, Hurst, Limehurst and Audenshaw, at Hartshead. The hospital proper is a corrugated iron building, containing two wards with 10 beds in

each ward, and with annexes for earth-closets and sinks, and kitchen and bath-room. The old farm house adjoining the hospital has been adapted into an administration block for the matron and nurses, and a cottage for a caretaker. Some out-buildings of the farm have been transformed so as to furnish a laundry, a disinfecting chamber with a Thresh's disinfecter, a storeroom, a dispensary, and dayrooms and bedrooms for convalescents and nurses, with bathrooms and w.c. A mortuary with two slabs is provided well away from the hospital."

Dr. Godson (Cheadle and Gatley Urban District) reports that :—

"In 1903 your Council made arrangements with the Withington District Council (which has now been incorporated into the City of Manchester) for admission of cases of scarlet fever, diphtheria, and enteric fever into their Sanatorium at Baguley. Three beds were retained, which so far have been quite sufficient for the needs of the district, unless there is a sudden outbreak. For cases of small-pox your Council has jointly with the Heaton Norris Urban District Council erected a temporary iron hospital of eight beds on the vacant land near our Sewage Outfall Works. Although quite ready for the reception of patients it has never as yet been used.

"The Barnes Convalescent Hospital send all their cases of infectious disease to one of the fever hospitals belonging to the Manchester Corporation.

"The Royal Lunatic Asylum : If a case should arise it is generally isolated in one of their detached houses, or sent to the Baguley Sanatorium.

"The Warehousemen and Clerks' Schools have their own Sanatorium for infectious disease, but also send cases to Baguley Sanatorium.

"Nine cases in all were sent to the Baguley Sanatorium during the year, viz. :—Eight from the district proper and one from the Warehousemen and Clerks' Schools."

Dr. Pomfret (Hollingworth Urban District) reports that :—

"The only isolation hospital in Longdendale is situated on Mottram Moor. The ownership is vested in the three Councils of Mottram, Hollingworth, and Tintwistle. It was built solely for smallpox. Six beds are kept ready with a potentiality for 16. Only one case, and that, I understand, a very doubtful

case, has ever yet been admitted. In my opinion, 'home isolation' has, in this district, been eminently satisfactory, and could not be improved upon by removal to hospital."

Dr. Butt (Hoole Urban District) reports, as under, regarding the Isolation Hospital accommodation :—

"In my last Annual Report I strongly advised the Council to endeavour to obtain further accommodation for their infectious cases. This has been done, and the following resolution of the Public Health Committee of the City of Chester, was received from the Town Clerk on the 16th of November last :—

"That the Hoole Urban District Council be informed that the Corporation regret that they cannot allot any additional permanent beds for cases from the Urban District, but that the Medical Officer is authorised at any time when the four beds retained by the Hoole Urban District Council are all occupied by Hoole patients, to admit to the Isolation Hospital additional patients from Hoole Urban District to the number of two, provided that, in his opinion, there shall remain, after admission, ample provision for all cases received or likely to be received from the City, and that in respect of such additional patients, the Urban District shall pay to the Corporation the usual maintenance charges as fixed by the existing agreement, and in lieu of any retaining fee, a sum of 10/- per patient for each week, or portion of a week, that such patient is in the Hospital."

It is the intention of the Council to accept the terms and conditions set out in the above resolution.

"In the early part of October, 1910, it was resolved by the Council that no charges be made to the ratepayers of the District in respect of expenses incurred by or incidental to the removal of patients from this district to the Chester Isolation Hospital."

A conference, presided over by Dr. Manby, Local Government Board Medical Inspector, was held during the year to discuss the advisability of the Runcorn Urban District providing a small-pox hospital of their own on a certain site. The site was, however, found to be unsuitable, and Dr. Manby urged the Runcorn Urban and Rural Councils to come to terms as to the joint user of the small-pox hospital belonging to the latter. So far as can be learned, however, at this date terms have not yet been agreed.

Five beds are reserved for the Chester Rural District in the Chester Isolation Hospital under agreement, for cases other than small-pox.

Malpas Rural District has arranged for the isolation of cases other than small-pox in Chester Isolation Hospital, and for small-pox cases has arranged with other districts in the Whitchurch Union.

Tarvin Rural District has an arrangement for the use of 8 beds in Chester Isolation Hospital similar to that made by the Chester Rural District.

Some few districts—Ashton-on-Mersey Urban District, Bowdon Urban District, Cheadle and Gatley Urban District, Knutsford Urban District, Sale Urban District, Wilmslow Urban District, and Bucklow Rural District have all, it will be seen, made “arrangements” entitling them under certain circumstances to the use of a limited number of beds in the Baguley Sanatorium.

Other districts use hospitals outside the Administrative County at Chester, Chinley, Stockport, Monsall, Ashton-under-Lyne, Heaton Norris, and Salford under a somewhat similar “arrangement.” Handforth Urban District and Disley Rural District are without Isolation Hospital accommodation, and appear to have no “arrangement” with any other local authority.

The following is a brief description of the chief of the Isolation Hospitals in the County :—

West Heath Joint Isolation Hospital.—The Authorities which have joined in this scheme are Congleton Municipal Borough, Congleton Rural District Council, Buglawton Urban District Council, Sandbach Urban District Council, Alsager Urban District Council, and Biddulph Urban District Council (Staffordshire).

The Hospital consists of Administrative Block, two large and one small pavilion, discharging block, disinfector, boiler house, etc.

The nominal accommodation is for 30 beds, but slightly more than this number of patients can be accommodated in an emergency. There is no resident porter now (February 9th, 1910), so the Porter's Lodge is fitted up with six beds for the reception of cases for isolation and observation.

The large block is used for scarlet fever, the next largest for typhoid fever, and the small block is meant for an isolation block, but is used somewhat indiscriminately for diphtheria or typhoid fever.

The whole building is well planned, and apparently well and economically managed. The sewage is pumped up for disposal by means of filtration through a slate bed, a coarse cinder filter, a fine cinder filter, and a shallow finishing filter. The site being a very flat and low-lying one, the fall of the drains has had to be somewhat economically managed, and in the man-hole nearest the disposal works the flow is usually sluggish. The effluent discharges into the Loach Brook, which runs through Somerford Park.

Crewe Isolation Hospital.—This hospital consists of 4 permanent pavilions, 1 for scarlet fever, 1 for typhoid fever, 1 for diphtheria, and 1 for observation purposes. There is also a discharging block provided, attached to the laundry block, where a Washington-Lyons disinfecter is fixed, and a mortuary is also provided. The laundry is furnished with electric power. There is no refuse cremator. The hospital is lighted by electric light, and the sewage is received into the Corporation sewers. The boundary fence is a brick wall on 3 sides, and corrugated iron on the other.

Nantwich Joint Hospital.—This is situated at Alvaston. There are 3 permanent pavilions, and on another side there is a temporary pavilion for small-pox. The permanent pavilions are, 1 for scarlet fever, 1 for diphtheria, and 1 which is used for typhoid fever or observation purposes. There is a discharging block, but no porter's lodge. The administrative block contains 11 bedrooms. There is laundry, mortuary, ambulance shed, &c., provided, and a Washington-Lyons disinfecter. The laundry is not provided with power. The hospital is lighted by oil lamps. The sewage runs into the Urban District Council's sewers. Chemical fire extinguishers are provided in the pavilion and in the administrative block. The boundary fence is a brick wall on 3 sides, and a 7ft. wooden fence on the other side.

Chester Isolation Hospital.—This Hospital, situated at Sealand, is used by the City of Chester, the Chester Rural District Council, Hoole Urban District Council, and the Joint Hospital Board of Tarvin, Malpas, and Tarporley. There are 5 permanent pavilions, and 1 corrugated iron observation block. The pavilions are apportioned to scarlet fever (2 pavilions), typhoid fever (1 pavilion), diphtheria (1 pavilion), and for observation purposes (1 pavilion). There is also a discharging block.

The administrative block is well arranged, and is furnished with 18 bedrooms. There is no porter's lodge. The laundry is not provided with power. There is a Washington-Lyons steam disinfecter, a mortuary, with viewing and post-mortem rooms, ambulance shed and refuse cremator. The Hospital is lighted with electric light, and the sewage passes into the Council's sewers. The boundary fence is a brick wall. Fire extinguishing apparatus is provided all over the Hospital and fire chutes are fitted in the administrative block.

Hyde Borough Hospital.—This Hospital consists of administrative block, 4 main pavilions, and small pavilion for observation cases ; laundry block with steam disinfecter attached ; mortuary separate ; small discharging block, used at date of visit for nurses from scarlet wards to change their dresses before coming into administrative block. The pavilions are arranged as follows :—

Two pavilions, scarlet fever, 32 beds in 4 wards.

Typhoid pavilion, 10 beds in 2 wards.

Diphtheria pavilion, 10 beds in 2 wards.

Observation block, 2 small wards with separate offices.

Discharging block, 2 small rooms and bath room.

Total number of beds, 54—scarlet, 32 ; typhoid, 10 ; diphtheria, 10 ; observation, 2.

The water supply is from the Council's mains, and the sewage goes into the Council's sewers. Brickwork. drainage, general arrangement of ground, etc., good, Woodwork poor throughout all pavilions. Floors particularly bad, composed of red deal, with somewhat rough surface. The moulding to take the place of skirting boards has shrunk badly, also several of the door frames.

Administrative block good size ; floors of all passages and several rooms, which are composed of wood blocks, in good condition. Special arrangements for fire extinguishing consist of small hose-van kept in ambulance shed, and chemical extinguishers elsewhere. National telephone and private installation to individual blocks. Present staff, 10 nurses and 10 maids.

Davenham Joint Hospital.—This hospital is used by the Northwich Urban and Rural Districts and Winsford and Middlewich Urban Districts. Consists of porter's lodge with discharging block attached ; administrative block ; diphtheria block, 6 beds ; typhoid block, 6 beds ; scarlet fever No. 1 block, 18 beds ; 2 large

wards and 2 small ones; scarlet fever No. 2 block, meant for isolation of convalescent cases, 10 beds, 4 in each of 2 large wards and 2 in single wards. Administrative block, 15 bedrooms and usual other rooms, also power laundry, Alliott & Paton disinfecter, mortuary and ambulance sheds. Staff consists of matron, 10 nurses and 8 maids, with 1 porter.

The water-supply is from the Rural District mains. The sewage disposal is by means of a private installation, which has recently been entirely remodelled.

The site is fenced round by a post, rail and wire fence 4 feet high, this being a double fence with a space of about 4 feet in between.

Runcorn Rural District Council.—Isolation Hospital, Dutton.—Erected 1905. Consists of porter's lodge, administrative block, discharge block, block containing laundry, mortuary, thresh disinfecter, stabling for 1 horse, harness room and ambulance shed; scarlet fever block, combined block for diphtheria and typhoid, small block for acetylene gas plant, administrative block containing matron's room, nurses' dining and sitting rooms, larder, etc., and 11 bedrooms. Six of these bedrooms are very small ones.

The scarlet fever block contains two wards with accommodation for 5 beds in each. The cubic space of each ward works out to about 2,000 cubic feet for 4 beds, and 1,000 cubic feet for the remaining beds, so that the wards really will accommodate 4 adults and 1 child each.

The diphtheria ward can contain 3 beds and 1 cot.

The typhoid wards, which are built on to the diphtheria ward, are two in number, each accommodating 2 beds.

The water-supply is from the Liverpool (Vyrnwy) supply, and the sewage is disposed of on an adjoining piece of land.

The present employees consist of matron, ambulance driver (who lives at the lodge), 1 staff nurse, 1 assistant nurse, 1 probationer and 3 maids. A laundress comes in for two days each week.

Some trouble is experienced now and then with the acetylene gas in the nature of smoky flames, and bad smells.

Wallasey Isolation Hospital.—Consists of well equipped Administrative Block with 6 single and 12 double bedrooms for nurses and maids and four bathrooms. There are four patients' blocks. Block 1 is in two separate halves, one half consisting of 7 beds for typhoid fever and the other half of 7 beds being utilised for diphtheria.

Block 2.—Two large wards with a day-room opening off each end used for convalescent scarlet fever. Total 20 beds. The patients admitted into this block from the acute ward have their clothing disinfected, and are bathed on admission. None with ear discharge or nasal discharge are admitted.

Blocks 3 and 4.—Both used for acute scarlet fever. Block 3 contains 30 beds and block 4, 24 beds. Each of these are modern blocks with day-rooms at each end and usual offices, &c.

Discharging block consists of relatives' waiting room, undressing and dressing-room and bath-room. The bath-room is not used, as it is regarded as unwise to give the children a bath immediately before going out.

Laundry.—Large and well equipped. Separate department of laundry for officers' clothing, &c. The machinery is power driven. Disinfector—two Lyon's disinfectors, rather small in size. There is a special heating or drying apparatus ensuring that mattresses, &c., after disinfection, shall be rapidly dried and quickly returned to infected houses. One room in a separate building is set apart for fumigation of hair mattresses, beds, &c. Adjoining the disinfector are two Lancashire boilers for the provision of steam to disinfector and laundry, and for providing hot water to the wards, house, &c. At the back of the disinfector there is a day-room for the use of the disinfectors, who have their meals there, and keep their cloaks, &c., there. Two bedding vans and one ambulance and stabling for one horse. The mortuary contains two slabs with a glazed-off viewing room.

The water-supply is from Council's deep wells, which are about 900 feet deep, and also from Liverpool supply.

The sewage is taken into the Council's sewers, and then passes into the River Mersey. There is a private telephone connecting all wards and laundry, &c., with administrative block.

A proposal is on foot to spend about £300 in building out from one of the existing blocks a small observation ward for isolation of intercurrent infectious disease or serious complications, the money is already voted.

Wirral Joint Hospital.—This is situated at Spital, about $1\frac{1}{2}$ miles from Spital Station. The districts using it are the Wirral Rural, Hoylake and West Kirby Urban, Neston and Parkgate Urban, Higher Bebington Urban, Lower Bebington Urban, Bromborough Urban and Ellesmere Port and Whitby Urban. There are 4 permanent pavilions for scarlet fever, typhoid fever and diphtheria respectively. The administrative block has recently undergone reconstruction and enlargement. There is a porter's lodge and refuse cremator, but no discharging block, the patients being bathed in the bath-room adjoining the wards. There is a mortuary, steam disinfector, ambulance sheds and laundry, the latter containing hand-driven machinery. Lighting is by means of oil lamps. Sewage is treated on the spot. The boundary is by means of a wall on one side and double iron railings with space between on the remaining three sides.

Baguley Sanatorium.—This hospital belongs to the Corporation of Manchester, and accommodates about 120 patients—scarlet fever, diphtheria, and observation cases. There is a porter's lodge and several large pavilions, with an 8-bed observation block. Excellent laundry, disinfector, stabling and mortuary are provided. Water-supply is obtained from the North Cheshire Waterworks Co. Sewage is disposed of on land adjoining.

Disinfection.—A good many districts are now provided with modern steam disinfectors, which in most instances are available for adjoining smaller districts. The problem of steam disinfection in large and scattered rural districts has not yet been satisfactorily solved, and as a result fumigation with formaldehyde or sulphur dioxide gas continues to be employed—a method not at all satisfactory for bulky infected articles such as mattresses.

Almost all Local Authorities distribute disinfectants gratuitously in cases of infectious disease. So long as these disinfectants are used for the actual destruction of infective matter which is known or suspected to exist in definitely ascertained places they serve a useful purpose. But all too frequently they are promiscuously sprinkled on floors, flushed down drains, scattered over ash-pits or dustbins, powdered or splashed into evil-smelling places, and so forth—modes of use which are absolutely futile and wasteful.

The amount of public money spent on disinfectants might be very considerably reduced if the articles were used for what science has intended them—the destruction of infection *in situ*.

The following are instances of what is being done in some of the districts in this direction.

In the Borough of Crewe it is stated that—

“The following quantities of disinfectants were used during the year :—

Izal	..	..	20 gallons.
Carbolie Powder	...	...	2 tons.
Izal Powder	...	...	1 ton.
Formalin Tablets	...	...	78 lbs.
Formalin	...	...	12 gallons.
Sulphur Candles	...	...	1 gross.

The number of persons supplied with disinfectants on application at the Sanitary Office was 1,353.”

In the Borough of Macclesfield Dr. Marsh reports :—

“We still continue distributing disinfectants gratis at the Town Hall. 8,941 lots were so given out this year, as compared with 8,461 the previous year.

“811 lots of lime wash and 826 brushes were loaned for applying same.

“This free distribution of disinfectants is a great farce and waste of public money, and I strongly advise the Sanitary Authority to discontinue the practice. It is greater cleanliness and less disinfecting that is needed. The pail and mop generously applied and not the shiftless scattering about of chemicals is what we mainly need.”

In the Urban District of Cheadle and Gatley it is reported that as soon as the Medical Officer of Health is informed that the house where a case of infectious disease has occurred is ready for disinfection, the Inspector fumigates it thoroughly with either sulphur dioxide gas or formaldehyde, which are not at all reliable methods, but are the only ones at their disposal.

“As far back as 1897 I was instructed to report on the various steam disinfectors then in use, and in February, 1898, after making investigations, I made a report and no action was taken in the matter. Since then I have drawn attention in each of my annual reports, and do so again in this to the

increasing need of a steam disinfecter. Bedding and articles of clothing have been sent on occasions to Stockport to be disinfected by steam, but this cannot be done regularly owing to the difficulty of sending articles and also the expense incurred."

In Lymm Urban District it is stated that :—

"Disinfection is still done by means of formalin, in spray or vaporizing by heat, and is satisfactory. Such articles as cannot effectually be so disinfected, or by boiling, are treated by steam at Warrington by arrangement with that Authority. In cases of typhoid fever the attendants upon the patient are warned that all the dejecta, urine, and fæces are sources of infection, and must be well mixed with carbolic acid before removal."

In Wilmslow Urban District it is reported that :—

"In all cases, premises were disinfected by spraying with a solution of formaldehyde. If bedding, infected clothing, etc., could not be disinfected by chemical disinfectants or boiling it was destroyed. By arrangements made between the Bucklow Joint Hospital Board and the Manchester Corporation, the Corporation will provide a disinfecting van and remove infected clothing, bedding, &c., to a disinfecting station, disinfect it, and return it. It is often less costly, however, to compensate the owner and destroy a bed or mattress rather than pay the expenses of disinfection by the Corporation."

In the Bucklow Rural District :—

"The usual practice has been continued. The clothing and bedding from all infected houses were removed to the Baguley Sanatorium and disinfected in the steam disinfecter. The rooms are disinfected with 'Konoform' or 'Formalin,' either by fumigation or spraying, and are afterwards stripped and distempered.

"With regard to disinfection in phthisis cases I can only write with regret. The public do not take the advantage of this part of my work that they ought to do. Where information is obtained, each house is visited, information and advice given, and offers made to disinfect at regular intervals. I am very anxious to do everything I possibly can do towards stamping out this disease, and yet in spite of all the visiting and advice given there is seldom any response from the public. I

trust that by the time the writing of the 1911 Report comes round I shall be able to show much improvement, and more good done."

In Nantwich Rural District the Sanitary Inspector reports that :—

"The cases of infectious disease notified had prompt attention ; special attention in each case was paid to the patient's bedroom, which was fumed with sulphur or formalin gas. All bed and body linen was put into a receptacle containing a solution of disinfectant and afterwards boiled. The beds, etc., were taken to the disinfecting station and there properly disinfected. In untidy and dirty houses the tenants were requested thoroughly to disinfect the walls and ceilings with limewash and to scrub all woodwork with soap and hot water. The infected houses were subsequently visited for the purpose of seeing that the instructions given had been carried out.

"The day schools at Acton and Warmingham have been disinfected ; the schools at Worleston were disinfected twice during the year after outbreaks of infectious disease. The rooms were fumed with sulphur and formalin gas. The desks, window ledges, walls, etc., were wiped down with cloths wrung out of a disinfectant solution, and the floors well scrubbed with soap and hot water, and the pencils placed in a pail containing a solution of disinfectant and afterwards wiped. The out-offices, ashpits and ashbins were disinfected and the contents afterwards removed."

The above are merely specimens of the work done under this heading, and afford sufficient evidence that local difficulties are being met on all hands in a reasonably thorough manner.

Bacteriological Examinations.—By the courtesy of Professor Delépine I am able to give a complete and recent statement as to the arrangements made by various Sanitary Authorities in the Administrative County for the examination of specimens from doubtful cases of diphtheria, typhoid fever, tuberculosis, &c. Commenting on the list supplied (reproduced below) Professor Delépine writes :—

"With few exceptions the authorities enumerated in the list have made use of the laboratory for ten years or more. Those belonging to the first group are connected with the laboratory by a sort of contract. At first this contract was based upon the payment of an annual minimum fee (M.F.) based on the population—but owing to the complication which this

system entailed, I have lately suggested an annual subscription (S.) of 1s. per 1000 inhabitants. Nearly all the Authorities have accepted the second arrangement.

"During the spring of 1910, an extensive outbreak of diphtheria occurred in Crewe, and during that outbreak, most of the bacteriological examinations for diphtheria were conducted at Crewe, the laboratory, supplying the apparatus and part of the media necessary. Dr. Angus Macdonald, of the Public Health Laboratory was appointed as a temporary assistant to Dr. Buckley for the purpose.

"The 6 places which have not made a definite arrangement with the laboratory have nearly all made occasional use of the laboratory for 8 or 10 years."

Public Health Laboratory, University of Manchester.

1. *Places in Cheshire definitely connected with the Laboratory (paying an Annual Subscription [S] or a Minimum Fee [M.F.]).*

Alderley Edge U.D.	... M.F	Knutsford U.D.	... S.
Ashton-upon-Mersey U.D.	S.	Lymm U.D.	... S.
Bowdon U.D.	... S.	Middlewich U.D.	... S.
Bredbury and Romiley U.D.	S.	Nantwich U.D.	... S.
Bucklow R.D.	... S.	" R.D.	... S.
Cheadle and Gatley U.D.	S.	Northwich U.D.	... S.
Congleton M.B.	... S.	" R.D.	... S.
" R.D.	... S.	Runcorn R.D.	... S.
Crewe M.B.	... S.	Sale U.D.	... S.
Dukinfield M.B.	... S.	Wilmslow U.D.	... S.
Hale U.D.	... S.	Winsford U.D.	... S.

2. *Places which are not definitely connected, but which send occasional specimens for examination.*

Altrincham U.D.	Hoole U.D.
Bollington U.D.	Hyde M.B.
Hollingworth U.D.	Marple U.D.

Macclesfield has an arrangement for a similar purpose with the Jenner Institute, and Lower Bebington Urban District Council send occasional specimens to the Thompson-Yates Laboratories, Liverpool, for examination.

Housing.—In September, 1910, the Local Government Board issued certain regulations under Section 17 (1) of the Housing and Town Planning Act as follows:—

WHEREAS by sub-section (1) of Section 17 of the Housing, Town Planning, &c., Act, 1909, it is enacted that it shall be the duty of every local authority within the meaning of Part II. of the Housing of the Working Classes Act, 1890 (herein-after referred to as “the local authority”) to cause to be made from time to time inspection of their district, with a view to ascertain whether any dwelling-house therein is in a state so dangerous or injurious to health as to be unfit for human habitation, and that for the purpose it shall be the duty of the local authority, and of every officer of the local authority, to comply with such regulations and to keep such records as may be prescribed by the Local Government Board.

Now THEREFORE, WE, the Local Government Board, in pursuance of the powers given to Us in that behalf, by this Order, prescribe the following Regulations; that is to say:—

Article I.—(1) The local authority shall as early as practicable after the date of this Order take into consideration the provisions of sub-section (1) of Section 17 of the Act of 1909, and shall determine the procedure to be adopted under these Regulations, to give effect to the requirements of that sub-section in regard to the inspection of their district from time to time.

(2) The local authority shall as part of their procedure make provision for a thorough inspection to be carried out from time to time according to the varying needs or circumstances of the dwelling-houses or localities in the district of the local authority.

(3) The local authority shall cause to be prepared from time to time by the Medical Officer of Health, or by an Officer designated by them but acting under his direction and supervision, a list or lists of dwelling-houses the early inspection of which is, in the opinion of the Medical Officer of Health, desirable. The list or lists may, if thought fit, relate to the dwelling-houses within a defined area of the district without specifying each house separately therein.

Article II.—The inspection under and for the purposes of sub-section (1) of Section 17 of the Act of 1909 shall be

made by the Medical Officer of Health, or by an Officer designated by the local authority but acting under his direction and supervision, and the Officer making inspection of any dwelling-house shall examine the state of the dwelling-house in relation to the following matters, namely:

- (1) The arrangements for preventing the contamination of the water-supply.
- (2) Closet accommodation.
- (3) Drainage.
- (4) The condition of the dwelling-house in regard to light, the free circulation of air, dampness, and cleanliness.
- (5) The paving, drainage, and sanitary condition of any yard or out-houses belonging to or occupied with the dwelling-house.
- (6) The arrangements for the deposit of refuse and ashes.
- (7) The existence of any room which would in pursuance of sub-section (7) of Section 17 of the Act of 1909 be a dwelling-house so dangerous or injurious to health as to be unfit for human habitation.
- (8) Any defects in other matters which may tend to render the dwelling-house dangerous or injurious to the health of an inhabitant.

Article III.—Records of the inspection of dwelling-houses made under and for the purposes of sub-section (1) of Section 17 of the Act of 1909 shall be prepared under the direction and supervision of the Medical Officer of Health, and shall be kept by the Officer of the local authority making the inspection or by some other Officer appointed or employed for the purpose by the local authority.

The records may be kept in a book or books or on separate sheets or cards, and shall contain information, under appropriate headings, as to:—

- (1) The situation of the dwelling-house, and its name or number,
- (2) The name of the Officer who made the inspection,
- (3) The date when the dwelling-house was inspected,

- (4) The date of the last previous inspection and a reference to the record thereof,
- (5) The state of the dwelling-house in regard to each of the matters referred to in Article II. of these Regulations,
- (6) Any action taken by the Medical Officer of Health, or other Officer of the local authority, either independently or on the directions of the local authority,
- (7) The result of any action so taken,
- (8) Any further action which should be taken in respect of the dwelling-house.

Article IV.—The local authority shall, as far as may be necessary, take into consideration at each of their ordinary meetings the records kept in pursuance of Article III. of these Regulations, and shall give all such directions and take all such action within their powers as may be necessary or desirable in regard to any dwelling-house to which the records relate, and a note of any directions so given and the result of any action taken shall be added to the records.

Article V.—The Medical Officer of Health shall include in his Annual Report information and particulars in tabular form in regard to the number of dwelling-houses inspected under and for the purposes of Section 17 of the Act of 1909, the number of dwelling-houses which on inspection were considered to be in a state so dangerous or injurious to health as to be unfit for human habitation, the number of representations made to the local authority with a view to the making of closing orders, the number of closing orders made, the number of dwelling-houses the defects in which were remedied without the making of closing orders, the number of dwelling-houses which after the making of closing orders were put into a fit state for human habitation, and the general character of the defects found to exist. He shall also include any other information and particulars which he may consider desirable in regard to the work of inspection under the said Section.

Article VI.—The Medical Officer of Health and any other Officer of the local authority shall observe and execute all lawful orders and directions of the local authority in regard to or incidental to the inspection of the district of

the local authority under and for the purposes of Section 17 of the Act of 1909, and the execution of these Regulations.

Article VII.—In these Regulations “the Act of 1909” means the Housing, Town Planning, &c., Act, 1909.

This was followed immediately by the following circular summarising the chief points in the Regulations:—

“I am directed by the Local Government Board to advert to Section 17 (1) of the Housing, Town Planning, &c., Act, 1909, under which it is the duty of every local authority within the meaning of Part II. of the Housing of the Working Classes Act, 1890, to cause to be made from time to time inspection of their district, with a view to ascertaining whether any dwelling-house therein is in a state so dangerous or injurious to health as to be unfit for human habitation, and for that purpose to comply with such regulations and to keep such records as may be prescribed by the Board.

“The Board have accordingly issued an Order making Regulations with respect to the manner in which inspection of the district under this Section shall be carried out, and with respect to the records to be kept of such inspection. Copies of this Order are enclosed.

“Under Article I. the local authority are to determine their procedure, which is to provide for thorough inspection of the dwelling-houses or localities in the district, and they must also cause to be prepared from time to time a list of dwelling-houses of which early inspection is desirable.

“Article II. enumerates the matters in relation to which inspection should be made, and Article III. prescribes the records to be kept of each inspection.

“Under Article IV. the local authority are to take these records into consideration at each meeting, and to give such directions and to take such action as may be desirable in each case, and a note of such directions is to be added to the records.

“By Article V. the Medical Officer of Health is required to include in his Annual Report certain information and particulars as to the inspections made and the results.

“By Article VI. it is made the duty of the Officers of the local authority to observe and execute all lawful orders and directions of the local authority in regard to the inspection of the district under Section 17 of the Act and under the Regulations.

“The Board are aware that many local authorities have already instituted a system of inspection under which inquiries are made by the Inspector of Nuisances or Sanitary Inspector in respect of the matters referred to in Article II., the results being recorded in a form which contains information on other points besides those mentioned in the Article. The Board do not suggest that this form should be abandoned or altered, provided that it includes all the matters covered by Article II. The provisions of the Order are necessarily limited to matters to be recorded as the result of inspections under and for the purpose of Section 17 of the Act.

“By Article 19 (3) of the Orders of 23rd March and 8th December, 1891, relating to Urban and Rural Districts and to London respectively, it is the duty of the Inspector of Nuisances or Sanitary Inspector, by inspection of the district both systematically at certain periods, and at intervals as occasion may require, to keep himself informed in respect of nuisances existing therein which require abatement. The local authority will no doubt usually designate the Inspector of Nuisances or Sanitary Inspector as the Officer who is to act under Article I. (3) of the Regulations.

“It will be open to the local authority, if they think fit, to delegate the duty of considering the records to a Committee, subject to such directions as they consider necessary.”

That the Act and Regulations made thereunder will not be allowed to become a dead letter is already quite evident, and Local Authorities on all hands are bestirring themselves as is evident from the following extracts from the Reports of Medical Officers of Health.

CONGLETON MUNICIPAL BOROUGH :—

“Towards the end of the year inspections under the Towns Planning Act were begun, but the time at the disposal of the Sanitary Inspector with his multifarious duties, must necessarily be so limited that it would be rash to predict when the inspection of the 2552 houses, assessed at £16 or under, will be completed.”

DUKINFIELD MUNICIPAL BOROUGH :—

"The house accommodation is, on the whole, decidedly good. Much of the worst property has been demolished or remains unoccupied. The majority of the people in the town belong to the working class, and during the last few years many excellent cottage houses have been built, fitted with modern sanitary arrangements and conveniences, and with plenty of air space. The number of plans submitted and passed for new houses is 40 compared with 50 in 1908, 61 in 1907, 61 in 1906, and 24 in 1905. In every case the drains are thoroughly tested by the Surveyor, and strict supervision is taken by him as regards structure and air space and fitness for habitation.

"We have a list of back-to-back houses, and the worst class property is kept under careful and periodical inspection, and improvements and alterations are insisted upon being carried out.

"The cases of overcrowding are very few indeed, and are becoming less year by year. We have a complete list of four-roomed houses where eight and upwards are living, and the Inspector has been very assiduous in tactfully altering matters where practicable. Judging from our reduced birth-rate in recent years, in my opinion we have very little cause for anxiety on this score."

MACCLESFIELD MUNICIPAL BOROUGH :—

"The density of population is 10.8 persons to the acre. In the centre of the town the density increases to 180 persons to the acre.

"The extension of the Borough into the surrounding country accounts for the apparent low density of the whole town. Some system of tramways is badly needed to open up the surrounding areas. It seems impossible for the town to grow unless much better facilities for getting into the district around are provided. Rapid means of locomotion seem nowadays to be essential to the vast majority of people, and certainly facilities for living on the outskirts of a town tend to improve the health of the people."

HYDE MUNICIPAL BOROUGH :—

"The owners of the following list of insanitary property attended a meeting of the Sanitary Committee, held towards

the close of the year, and have agreed to submit plans for putting it in a sanitary condition :—

Nos. 26 and 28, Catherine Street, and Nos. 1 and 2, Washington Court. Four back-to-back houses.

Nos. 3 and 5, Mary Street. Two single houses without through ventilation.

Nos. 6, Queen Street, and 1, Unsworth Court. Two back-to-back houses.

Nos. 59 and 61, Old Road, and two houses in Firth Court. Four back-to-back houses.

No. 32, Ridling Lane, and house behind in Smith's Court. Two back-to-back houses.

No. 25, Cheapside, and house behind. Two back-to-back houses.

Nos. 1 and 2 Dakin Court. Two single houses without through ventilation.

Nos. 151 and 153, Back Lane, and two houses behind. Four back-to-back houses.

Two cellar dwellings in Acorn Lane. The owner has agreed not to re-let these when the present tenants, who are very old people, vacate them. Only one person lives in each.

“The ashpit accommodation is very defective in Charles Street. On both sides of the street the houses have very small back yards, with neither ashpits nor ashbins provided. The ashes and refuse are thrown over the wall into a narrow passage, which is unpaved and uncovered, giving rise to a very insanitary condition. The common passage which now serves as an ashpit should be paved, ashbins provided, and provision should be made for the removal and emptying of the ashbins by making an opening from each back yard into the common passage behind.

“The following insanitary property has been put in a sanitary condition during the year :—

No. 57, Hyde Lane and the house behind have been converted into one house, with through ventilation.

Nos. 6 to 8, Walker Lane, have been altered so as to provide through ventilation.

Nos. 1 to 4, Chapel Square, Newton, have been closed.”

STALYBRIDGE MUNICIPAL BOROUGH :—

“The people are on the whole well housed, though, as may be expected in an old town such as Stalybridge, there are still some slums, and these must receive attention under the Housing, Town Planning, &c., Act, 1909.

“A cottage, No. 4, Wood Street, was deemed unfit for human habitation and was closed by the owner at my request.

“In a few instances of overcrowding the tenants were persuaded to remove to other premises with more accommodation.

“There is, however, in my opinion urgent need for a greater number, as well as for more commodious, houses for the working classes. The erection of new cotton mills has not been accompanied by a like building of new houses for the operatives, many of whom are consequently derived from neighbouring boroughs.”

“Many parts of the Borough have been systematically inspected by the Sanitary Inspector, by the Lady Health Visitor (who holds the Royal Sanitary Institute Certificate), and by myself, with the result that several cases of overcrowding have been discovered and many nuisances have been revealed, and I have in consequence condemned several premises until such repairs, sanitary alterations, or removal of the inmates to other dwellings as might be necessary, have satisfied me of the fitness of the premises.”

HIGHER BEBINGTON URBAN DISTRICT :—

“No new house was completed in 1909, and only nine were built in 1910. Since my appointment I have begun to examine the cottage property in detail, as required by The Housing and Town Planning Act, 1909, and will shortly present a report dealing with the old property in the Bankers' Hill area. Many of the cottages in the upper ward are old, but on the whole their surroundings are cleanly, and there is a sufficiency of open space about them.”

BOLLINGTON URBAN DISTRICT.—The Sanitary Inspector reports :—

“Five new houses have been certified as complete and fit for habitation, and three old houses have been closed voluntarily by the owners rather than incur the expenditure required to carry out such sanitary improvements as would render them fit for human habitation.

"So far as the inspection of houses, under the new system, has gone, it appears that the want of ventilation, or insufficient ventilation, is likely to account for the greatest number of defects in the housing conditions, and the Regulations would have been more complete and better to work under if some standard of ventilation and air space had been fixed. As it is now, judging by the form of card supplied, through ventilation is to be required, and windows provided which are to be made so that half of each will open.

"Powers of entry are given in the Housing Act, and the report of each house includes sanitary accommodation, number of occupants, number of rooms, condition of roof, walls and ceilings, and also the cleanliness of each house.

"When the record is completed it will be a very full and detailed one of the housing conditions in the district."

BOWDON URBAN DISTRICT.—The working classes occupy mostly 4-roomed houses, with well-paved yards and water or earth-closets. There are no back-to-back houses. The streets adjoining are wide, well-paved, and the cleanliness of the surroundings are satisfactory.

BREDBURY AND ROMILEY URBAN DISTRICT:—

"The house accommodation is not in excess of the requirements of the working classes or residents, any new houses being quickly tenanted.

"The number of houses completed during 1910 is 35, and plans, representing 105, were passed by the Building Committee.

"Speaking generally, there is sufficient open space about the houses, and the surroundings are healthy, with a few exceptions, where fowls, &c., are kept. I have noticed, on inquiry being made as to the cause of diphtheria cases, how often there is some suspicious connection with sickness amongst fowls and ducks in close proximity to dwellings; whether the fowls and the children suffer equally from some other cause, or whether they are more intimately connected with each other, I cannot yet assert, but that there is some connection I am satisfied."

BROMBOROUGH URBAN DISTRICT:—

"Three houses were considered unfit for habitation and two of these were converted into lock-up shops. Informal

notices in respect of nuisances were given in 22 cases and were complied with."

CHEADLE AND GATLEY URBAN DISTRICT:—

"Sixty-three new houses were built and occupied during the year, as compared with 52 in the previous year and 62 in 1908. They have all complied with your Council's Bye-laws, and the majority of them are small villas and semi-detached houses and are situated as follows:—

Cheadle Ward.....	16	mostly cottages.
Gatley Ward	7	villas and semi-detached.
Cheadle Hulme North Ward	9	„
„ South Ward	31	„

"Plans have been presented and approved for three new streets.

"As I have remarked in my previous annual reports, Cheadle Hulme, especially the South Ward, is rapidly growing, and several old cottages have been demolished, being too dilapidated for human habitation. The want of suitable cottages for the working classes is becoming more acute each year."

COMPSTALL URBAN DISTRICT:—

"The houses are well built and of sufficient accommodation. There are plenty of open spaces, and the streets are kept in a clean condition. No cases of overcrowding have been reported. No new houses have been erected."

ELLESMERE PORT AND WHITBY URBAN DISTRICT:—

"Building operations are proceeding rapidly as evidenced by the erection of 250 houses during 1910. The newer cottages are airy and well built in accordance with modern requirements. The growth of the town tends to be in the form of long streets with houses of one uniform type or pattern, and it is only here and there that a cottage with any claim to artistic beauty is found. If the builders could be prevailed upon to build cottages in pairs or in small groups it would be of advantage to the health of the occupiers. Your Council have under consideration the adoption of a scheme under the Town Planning Act, for laying out an area in the neighbourhood of the town, and the carrying out of such a plan would enormously benefit your industrial

population. Under the Housing and Town Planning Act you have made arrangements for the systematic inspection of the houses in your district, and for the keeping of records connected therewith as required by the Regulations of the Local Government Board. Some of the older property has been inspected by me and a report will be presented at an early date. The streets are broad and well constructed, and all the back passages which I have seen during my visits, are paved and kept well cleansed.

“Your building inspector exercises supervision over each stage in the erection of new houses.”

HALE URBAN DISTRICT:—

“Artisans’ dwellings are rapidly going up in the district, particularly on Hale Moss. These seem to “let” readily, but so far as the internal needs of the district are concerned, I think they are amply met.

“A certain amount of “inspection” has been made under the Housing Regulations (1910) Act, but no action has been necessary therefrom.

“With regard to the Housing and Town Planning Act, 1909, a Committee has been formed and a scheme is in formation, but no action of a sanitary nature has been necessary under the Act.”

HOOLE URBAN DISTRICT:—

“The house accommodation for the working classes is fully adequate for the needs of the district; the houses are well built with ample space between. The erection of new houses has been thoroughly supervised by the Council’s Surveyor. No action has been taken under the Housing of the Working Classes Act.

“Six new houses were erected during the year by private enterprise, all of which complied with the Bye-laws in force relating to new streets and buildings.

“The Housing and Town Planning Act, 1909, is receiving the attention of the Sanitary Officers of the Council, and arrangements are being made to carry out its provisions as early as possible in the new year.

HOYLAKE AND WEST KIRBY URBAN DISTRICT:—

“There is ample housing accommodation for the working classes. Modern well built cottages form by far the larger proportion of artisan dwellings. Some few habitations in the older parts of Hoylake are not in accordance with present day requirements. These are in process of being dealt with under the Housing and Town Planning Act of 1909.

“This Act throws additional responsibilities of considerable importance on Local Health Authorities, and involves thorough inspection of all property under £16 rental.

“A schedule has been presented to your Council of houses “the early inspection of which is desirable,” and these will be reported upon in due course.

“Three blocks of property have been reported upon in detail, and representations as to unfitness for human habitation have been made in the case of 5 houses.

“Two houses are being demolished in anticipation of the new demands under the Act.

“There is as a general rule ample open space provided about the cottages both at front and rear. Well paved passages, which are readily kept clean, have been provided throughout the district. The commendable practice of constructing small houses in pairs instead of in long streets is gaining in popularity. Adjacent to the Meols Parade and Forest Road there are a number of temporary structures of the bungalow type. These are occupied in the summer weather by devotees of the open air movement. The Council have drawn up stringent regulations regarding the occupancy of these. Every occupant of a bungalow has to make annual application for permission to occupy, and has to enter into an agreement to conform with the following conditions:—

1. Period of occupancy to be from May 1st to September 30th,
2. Suitable sanitary convenience to be provided and kept in a cleanly state.
3. Dust bin to be provided for refuse.
4. The whole of the premises to be kept in an orderly state, and no overcrowding to be allowed.

5. No new bungalows nor any additions to existing ones will be allowed.
6. Adequate water-supply from Company's main to be provided.
7. In other respects to the satisfaction of the Medical Officer.

"Plans were approved during the year for 41 houses, 1 shop, 3 stables and motor houses, 1 workshop, 1 public concert room, 1 new street, 23 additions to existing premises, and 8 temporary buildings were allowed under agreements.

"The total number of houses in the district is estimated at 3,086.

"Forty-three houses were built and completed during the year, also 1 higher elementary school, 1 hospital, 1 schoolroom, 3 motor houses, and 17 additions.

"At the end of the year there were 14 houses in process of erection.

"A new Building Bye-law has been adopted which prohibits the occupation of new houses unless such are certified by the Surveyor to be fit for habitation. Further Bye-laws relating to new buildings are at present under consideration.

"Sixty-three cases of contraventions of Building Bye-laws were reported to the Health Committee, and their instructions to secure compliance were carried out. Legal proceedings were taken in one case for contravention of Bye-laws, and a conviction obtained. In 6 cases buildings of a temporary character which had been erected in contravention of the Council's Bye-laws were pulled down."

KNUTSFORD URBAN DISTRICT:—

"I have made an official representation to the Council under Section 5 (2), defining a certain area in terms of Section 4 (b). I have long had this area under consideration, but have felt at a loss how to deal with it; and even now I am unable to suggest any improvement scheme within the bounds of financial possibility. My representation is therefore by way of an experiment, to see what will come of it (And I have other areas in view which have just

as much need to be reported). A brief verbal description may be given. Take a square A.B.C.D., and then reduce the length of one side A.D. by one-third, by "bending in" the sides B.A. and C.D. Along the side A.B. place 7 large shops, which are also dwelling-houses; along B.C. 6 smaller shops and dwelling-houses; along C.D. 7 cottages; and along D.A. a high brick wall. In the well thus formed place out-buildings, yards, wash-houses, closets, and ashpits for all 20. One narrow entry exists, bent at a right angle, running from B.C. to C.D. No other means of access, or ventilation, except certain covered passages (*i.e.*, running through the body of the buildings) generally closed by wooden doors. The necessarily insanitary condition of the small and overcrowded area which forms the "back-premises"; and the way in which each one of the houses contributes to the common nuisance, injurious alike to itself and its neighbours; and the impossibility of demanding improvement in any one case without taking all the others into consideration at the same time, are the reasons which seem to me to require that this area be "represented" under Part I. of the Act.

"Under Part II. of the Act I have also reported two cottages in Gaskell Avenue, and two "back to back" houses in Silkmill Street. The latter have been repeatedly reported during several years past.

"Nothing has yet been done, beyond the provision of note-book and register, in consequence of the impending change of Inspector. It is intended to entrust the work to the new Officer, who is to be a qualified man, and to give his whole time to the Council's work. The notes which Dr. Fennell made on the property described in the last paragraph will be at his disposal, and it will no doubt shortly be possible to proceed under this Act instead of under the older one. Dr. Fennell devoted much time and care to the detailed inspection of this property; as well as to the whole of Silkmill Street, and other individual houses for which it is only right that he should receive full credit; all this work, though not technically done under these Regulations, was practically of the exact nature which they require."

LYMM URBAN DISTRICT:—

"The population is made up of a residential portion occupied at Manchester, 13 miles away, and at Warrington; of shopkeepers, of local artisans and operatives (fustian cutters),

of artisans and operatives living in the district and working outside it, and finally of an agricultural portion.

"The house accommodation throughout the district is sufficient, and fit for habitation. The open space around the houses is ample, and the surroundings of the dwellings are clean.

"Plans of all new buildings must be submitted to, and approved by the Urban District Council.

"During the year 1910 plans for 11 new houses, small semi-detached villas mostly, were passed, as against 6 last year, and 7 in 1908."

MOTTRAM URBAN DISTRICT :—

"Four new houses, plans of which were passed last year, have been built.

"Great improvement in the district has taken place. A number of old houses have been pulled down, and substantial cottages erected in their places, plans for which were passed in 1909.

"The Housing, and Town Planning, &c., Act, 1909, has now come into force, and affects every Rural and Urban District.

"Acting on the same, your Council have instructed the Sanitary Inspector to report on the property in your district, and, where necessary, bring any bad cases at once under their notice.

"Quarterly reports will be submitted to the Council by the Inspector."

NANTWICH URBAN DISTRICT.—The Sanitary Inspector Reports :—

"In 1909 the Housing and Town Planning Act, which requires Local Authorities to carry out a systematic house to house inspection of their districts, was passed. I may say that previous to this Act coming into force I had already commenced a sanitary survey of the district, and had inspected and examined 1240 houses in all parts of the town. The result of such inspections have been entered into record books kept for that purpose.

"During my inspections I have come across a large number of offensive privies with wet ashpits attached thereto ; the condition in which these are in makes it almost impossible for

them to be effectually cleansed. The only remedy for these is to have them converted into water-closets as soon as the new water scheme is completed.

“Another serious state of things coming under my notice was the large number of houses with either defective, insufficient, or entirely without ashpit accommodation ; wood boxes, barrels, tubs, pails, etc., being used, and in the cases where no ashpit existed the house refuse is deposited on the adjoining ground. I am pleased to say that this state of things is gradually being done away with, proper galvanized dust bins are being provided.

“Whilst dealing with the housing problem, I must also report that there are a large number of houses, the water-supply to same being from a tap placed in the yard, and used in common by several other houses. In some cases the taps are fixed a considerable distance from the houses which have no sink-stones, a gully in the yard being the only drain available for slop water. To my mind this is a state of things which should not be allowed to exist ; each house should have a sink-stone and water-supply fixed inside the scullery or back kitchen.

“Seventeen overcrowded houses have been reported to the Council. The occupiers were served with notices to reduce the number of inmates, so as to give a minimum cubic space of 300 cubic feet for adult persons, and 150 cubic feet for children under 12 years of age. Eight of the persons reported complied with the notices, in three cases the occupants removed to larger houses, and the other five reduced the number of inmates so as to comply with the notices. On June 30th, 1910, a special meeting of the Housing Committee was held to discuss the overcrowding problem, and a special report was presented by me to the Committee. Inability to secure cheap cottages and poverty were the chief reasons given by the other persons reported for not removing to larger houses.

“Eighteen complaints were received by me, and prompt attention was given to them. In addition to making the proper inspections of the houses, I have regularly visited the slum property in the district.”

NESTON AND PARKGATE URBAN DISTRICT:—

“The newer houses and cottages are well built with sufficiency of open space as required by the Bye-laws in force in the district. In the older portions of the villages there are cottages crowded together in narrow “weints,” with insufficient light and air, and the surroundings of which cannot possibly be kept in a cleanly condition. It is your intention to deal with

these at an early date, and I have already received your instructions to prepare a detailed report for your consideration under The Housing and Town Planning Act, 1909. Ten new houses were built during 1910. The total number of houses in the district is now 1124, an increase of 329 over the number in 1901.

“New houses are inspected by the Surveyor in every stage of their erection, and the Building Bye-laws are thoroughly enforced.”

NORTHWICH URBAN DISTRICT:—

“The total number of new buildings put up during the year is 44.

“Four houses have been condemned by the Medical Officer of Health as unfit for habitation and closed. Two of them have since been reconstructed, and 4 back to back houses also condemned by the Medical Officer of Health have been converted into two houses.

“Overcrowding has occurred and been dealt with in sixteen instances, some of them recurring more than once; it is the irony of circumstances that where the family is largest there is more money required for food and clothes, leaving less for house rent, in fact making it impossible for poor people to live and also pay the high rent for a comparatively big house.

“Some relief to the demand for cottages will undoubtedly be realized owing to the numbers who have already and those who are about to emigrate to Canada.

“The Council have actively taken up the consideration of the Housing, Town Planning, &c., Act, 1910, and have appointed a Committee thereunder. Several schemes of town planning have been suggested, and the Inspector, under my supervision, has commenced an inspection of certain parts of the district with a view to recording and reporting upon the results of his visits to the Committee.”

RUNCORN URBAN DISTRICT:—

“A number of new houses have been built during the year and added to the house accommodation. Some of them are of a more expensive sort. The repairing and improving of the old class of cottage appear to go on much as in former years, and there seems at present to be enough of cottage property available to meet the demand.”

SANDBACH URBAN DISTRICT:—

“The house accommodation for the working classes is ample, and the houses are in a very satisfactory condition as to state of repair and air space, and are not overcrowded. There are 22 houses uninhabited in the district.

“No new houses have been erected during the year.

“With regard to the housing accommodation of the district and inspection under the Housing (Inspection of District) Regulations, 1910, I understand the Council are now considering these Regulations, and will determine the procedure to be taken in connection therewith at the present meeting. In August, 1909, a house to house inspection was commenced by the Sanitary Inspector, and since that date 326 inspections have been made. The records are kept on a separate sheet for each house, and embrace all the matters enumerated under Article II. of the Housing (Inspection of District) Regulations, 1910, with the exceptions of numbers 4 and 7. No closing orders have been made.”

WALLASEY URBAN DISTRICT:—

“A large amount of work has been done during the year to improve the housing conditions prevailing in some parts of the district.

“In compliance with the provisions of the Housing Acts, the following 25 houses were represented as unfit for habitation :—

47, Oakdale Road
1, 2 and 3, Hygeia Cottages,
1 and 2, Laburnum Cottages,
27 to 51, Burnaby Street,
1 to 5, Union Court, Union Street,
The Old Farm, Poulton,
5, Stafford Buildings.

“The following Closing Orders were made (20 in number) :—

1 and 2, Mona Place (represented as unfit in 1909),
47, Oakdale Road,
1, 2 and 3, Hygeia Cottages,
1 and 2, Laburnum Cottages,
27 to 51, Burnaby Street,
The Old Farm, Poulton.

“All the above were closed in accordance with the Orders and 3 additional ones, 1, 2 and 3, Garden Cottages, Wallasey Village, which were closed under an agreement made in 1909.

“The following houses were demolished (12 in number):—

191a, Wheatland Lane (represented in 1909).
 191b, Wheatland Lane do.
 20, School Lane do.
 1-5, Hope Place do.
 4, 6 and 8, Wallasey Road do.
 47, Oakdale Road (represented in 1910).

‘The following houses have been thoroughly repaired (3):—

195, Wheatland Lane,
 1 and 2, Laburnum Cottages.

TABULAR INFORMATION WITH RESPECT TO INSANITARY PROPERTY DEALT WITH IN WALLASEY DURING 1910.

No. of Houses inspected under Section 17 of the H.T.P.A., 1909	...	...	...	...	25
No. of houses found unfit for habitation	...	...	...	...	25
No. of houses represented to Local Authority for Closing Orders	...	...	...	...	25
No. of Closing Orders made	...	...	...	...	20
No. of houses where defects were remedied without making of Closing Orders	...	...	...	...	—
No. of houses made fit after making of Closing Orders	...	...	...	...	3

GENERAL CHARACTER OF DEFECTS FOUND.

1. Lack of sufficient or through ventilation.
2. Inefficient water-supply, *e.g.*, one standpipe for several houses.
3. Lack of proper W.C. accommodation.
4. Damp and dark rooms.
5. Lack of conveniences for decent living, *e.g.*, proper facilities for storing food, washing accommodation, etc.
6. General dilapidations.

“The following additional work has been done under Sections 14 and 15 of the Housing, Town Planning, etc., Act, 1909 :—

Statutory Notices served	...	...	...	9
„ „ complied with	...	...	...	6
„ „ in hand	...	...	...	2
„ „ not complied with	...	...	...	1

“There was one appeal to the Local Government Board against a demolition order, but the appeal was subsequently withdrawn.

“In the work in regard to insanitary property there has always been kept in view the fact that any work of demolition must not be done too rapidly, so that hardships may not be inflicted on tenants by their being unable to find suitable houses in the time at their disposal.”

WILMSLOW URBAN DISTRICT:—

“There is a considerable number of old cottages in the district. On the whole, they are in good sanitary condition, and none have been condemned during the year.

“Complaints have been made that there is a deficiency of cottages. The supply certainly does not exceed the demand. There are few, if any, cottages empty at the present time. Families wishing to remove have to wait until a house becomes vacant, and one hears of people who wish to start house-keeping having to wait in lodgings. Also, some families would no doubt like to exchange the old cottages they live in for new ones at a moderate rent.

“The complaints would appear to refer chiefly to a lack of cottages at about 4/- a week. Very few at this rent have been built in recent years, or are likely to be built in the future. In 1910, eight working-class houses were built: four are let at 4/- a week, and are situated two miles from the station; the others will command a considerably higher rent.

“It is difficult to say what the demand really amounts to. There is no evidence of overcrowding, which one would expect to find if there were a real deficiency of accommodation; nor are there many people working in the district and living outside for this reason.

“It must be admitted, however, that the demand is fully up to the supply, and that there is some inconvenience felt by people who want cottages. The question does not appear to be of great urgency at the present time, though it may soon require the consideration of the Council.”

WINSFORD URBAN DISTRICT.—The Sanitary Inspector reports:—

“Six houses have been inspected by Dr. Garstang and myself conjointly, and action is being taken with respect to defects discovered, as a result of special instructions issued by the Council, with a view to the adoption of a system for carrying out the provisions of the above Regulations.”

BUCKLOW RURAL DISTRICT.—Dr. Garstang reports that:—

“The Regulations were under the consideration of the Health Committee up to nearly the end of the year. On November 25th I was instructed to prepare a list under Art. I. (3); and with the assistance of Mr. Metcalfe and Mr. McKenzie I submitted the following “off-hand,” viz. :—

Northenden.—Back Church Street, Church Street, Boat Lane, Mill Lane, Ford Lane, Moor End.

Baguley.—Floats Lane.

Timperley.—Baker Street, Orchard Place, Cow Lane, Tannery Cottages, Washway Cottages.

Dunham Town.

Dunham Woodhouses.

Styal.—Oak Cottages, Village generally.

Northen Etchells.—Moss Nook.

Partington.—Kilnbutts Terrace, Lock Lane, &c.

Carrington.—Cottages (nr. Post Office), Back Lane.

Mobberley.—Town Lane.

Peover Superior.—Peover Heath, Park Gate.

Rostherne.—Old Cottages.

“The Committee thereupon decided that inspections should commence with the above list; this was confirmed by the Council on December 14th, Mr. Metcalfe being appointed under Art. II. Books, &c., had then to be provided; the Christmas holidays ensued; and so no work was actually done in 1910, but all preparations were complete for a systematic commencement in 1911.”

The Sanitary Inspector adds:—

“This work has not gone on with the same expedition as in previous years, owing to the fact that the Housing and Town

Planning Act, 1909, was under the consideration of the Council. Forty-two of the houses inspected would come under this heading, and the inspections under the old regime would thus be brought up to a total of 684. Where nuisances or defects were found to exist, informal or statutory notices were served to put matters right.

“The system of inspection under the new Act will be quite different to what has previously been carried out, and will entail much more attention to details, which could not be dealt with in a satisfactory manner under the Public Health Acts. The Council towards the end of the year decided upon the inspection of a large number of houses as submitted by the Medical Officer of Health, and decided that the Inspector should make such inspections. The necessary register and notice forms, etc., have been obtained, and the work of inspection was commenced early in January, 1911.”

CONGLETON RURAL DISTRICT:—

“We have been very short of accommodation at Elworth for the last few years, owing to the increase of the motor wagon works belonging to Messrs. Foden, Limited, but several houses of a nice type have been erected, and more are still contemplated in other parts of the district. The accommodation is good.”

MACCLESFIELD RURAL DISTRICT:—

“The house accommodation is fairly good ; the majority of the houses are of the farmhouse and cottage variety, with clean surroundings and plenty of air space.

“Two cases of overcrowding of sleeping rooms have occurred which necessitated arrangements being made for some members living elsewhere in both cases.

“Six houses have been dealt with under the Housing of the Working Classes Acts.

“During the year plans have been deposited for 29 new houses, and careful supervision is kept over the erection of new houses.”

The Sanitary Inspector adds :—

“Three houses, which were so damp as to be injurious to the health of the occupants, were improved by the provision of means for carrying off the roof water, by structural repairs, or

by draining the sites, and in one instance by the insertion of a damp-course in the walls of a house which had been built without any such provision before building bye-laws were in force.

“Twenty-two sleeping rooms which had not adequate means of ventilation were provided with sash or casement windows. Two sleeping rooms were found to be overcrowded when occupied. Provision was made to obviate this. Three houses, which were without means of through ventilation, were provided with back doors and windows made to open to meet this deficiency.

“Many other nuisances arising from blocked drains, inefficient means of drainage disposal, the keeping of swine and other animals, defective yard paving, and accumulations of house refuse, etc., were abated.

NANTWICH RURAL DISTRICT:—

“The Inspector of Nuisances has been appointed by the Council to carry out the inspections under the Housing and Town Planning Act. A careful and systematic attempt is being made to make a complete survey of the district with regard to housing conditions, particulars of which will be found in the Inspector’s report attached. I am called in by the Inspector whenever any difficulty arises, and have on several occasions accompanied him during his systematic inspections.

“I am of opinion that the conditions as to housing in this district compare very favourably with those to be found in most Rural Districts, and are greatly superior to those to be found in the industrial regions of large towns.

“I may say that before the Housing and Town Planning Act was passed the Inspector was carrying out practically the very system of inspection recommended by the Local Government Board in their Order of 1910.”

The Sanitary Inspector adds:—

“The Housing and Town Planning Act, 1909, imposes additional responsibilities upon the Council and its Health Officers. The aim of the act is to secure healthy homes for the working class. In future contracts for letting a house at a rent not exceeding £16 in districts having a population less than 50,000, there is to be implied (a) a condition that the house is at the commencement of the holding fit for

human habitation (except when let for not less than three years, and the lessee is to put it into a fit condition, and (b) an undertaking that the house shall be kept so fit by the landlord. If the undertaking is not complied with the Local Authority is to require the landlord, by twenty-one days' notice, to execute the necessary works, and if the requisition is not complied with, and if the landlord does not give notice of his intention to close the house, the Local Authority may do the work and recover the expenses from the landlord. He has a right of appeal to the Local Government Board. According to the Act it is the duty of every Sanitary Authority to see that their district is inspected from time to time, for the purpose of ascertaining whether any dwelling-house therein is unfit for human habitation. Since my appointment as Inspector of Nuisances to the Nantwich Rural District Council my inspections have been carried out on the lines imposed on Local Authorities by the Town Planning Act. The houses inspected by me up to the end of the year numbered 1,981. The farms inspected, including Small Holdings, numbered 398. The following figures indicate that special attention has been paid to the houses occupied by the working class. Of the number inspected, 438 had one room, scullery, and pantry on the ground floor, and two bedrooms on the first floor; 33 had one room, scullery, and pantry on the ground floor, and three bedrooms on the first floor; 153 had two rooms and pantry, but no scullery on the ground floor, and two bedrooms on the first floor; 374 had two rooms, scullery and pantry on the ground floor, and two bedrooms on the first floor; 639 had two rooms, scullery, and pantry on the ground floor, and three bedrooms on the first floor, making a total of 1,627.

“During the past year 224 dwelling-houses were inspected. There are no cellar dwellings in the district. On making an inspection of a dwelling-house notes are made (1) as to the condition of the internal and external walls, of what materials constructed and whether a damp-proof course is provided; (2) floors, whether above or below the level of the adjacent street or ground, the state of repair and if constructed of flooring boards, whether space under the floor is properly ventilated; (3) the roof covering, state of repair, and whether eaves spouting is provided to prevent dampness of walls; (4) windows, whether sash or casement, and if made to open; (5) number and size of rooms, and how ventilated; (6) drains, their construction and outfall, whether to sewer, cesspool, or ditch; (7) paving of yard and surface adjacent to house, of what materials; (8) ashpits

and privy accommodation, distance from house, and means of access for cleansing; (9) water-supply, whether from mains, well, or spring. During the year 9 insanitary cottages were demolished after larger houses had been erected for the housing of the tenants, and two insanitary dwelling-houses permanently closed.

“On making house to house inspections among the poorer class, several have complained to me about the inadequate number and size of their sleeping rooms. The houses which have been and are now being erected on the Doddington Estate, for the housing of the agricultural labourers and their families, are very commodious, and contain the number of sleeping rooms recommended by the Rural Housing and Sanitation Association. Each house has a large living room, scullery, and pantry on the ground floor; there are three good sized bedrooms on the first floor; in two of the rooms there are firegrates, which are a great convenience in time of sickness. The houses are properly drained, and the usual out-offices provided.

“When building houses it would be a good thing if all estate owners and agents would follow the example set by Sir Delves Broughton (and his agent, Mr. John Loring), who during the past few years has provided excellent housing accommodation for the labourers on his estate. Great improvements have been made in the housing accommodation on the Haughton Estate. In some instances additional bedrooms have been provided.”

NORTHWICH RURAL DISTRICT:—

“During the year plans were passed for 40 new houses, in addition to which 10 houses were built on Crown lands which are outside the jurisdiction of this Sanitary Authority.

“Overcrowding has been discovered in three cases and abated.

“Three houses have been condemned by the Medical Officer of Health as unfit for habitation. One was demolished and the other two are being dealt with under the Housing of the Working Classes Act.

“All plans of new houses are submitted to the Council after being scrutinized by a committee, by whom they are rejected if the Bye-laws are not complied with, and if there is not an adequate water-supply and efficient drainage. The Bye-laws are being revised with a view to the construction

of houses which shall be sanitary and yet cheaper than are usually built; as the demand is for the cheap cottage and one which a man with a labourer's wage can afford to pay, the abolition of the small cheap cottage means that the higher rented six-roomed house must be taken and two families have to join forces to pay the rent, for after all they must live somewhere, and barring public institutions such as prisons, workhouses, lunatic asylums, and isolation hospitals, together with cottage homes, epileptic colonies, &c., there is no method of housing a family without paying rent, and I don't think it is a good hygienic or economic policy to increase the number who have to live in institutions more than is absolutely necessary."

RUNCORN RURAL DISTRICT.—Dr. Adams reports:—

"I regret that I am, at present, unable to furnish your Council with the information requested under this paragraph. The Housing, Town Planning, &c., Act, of 1909, has not yet been put into active operation within your district, but my Annual Report affords information as to inhabited houses and housing accommodation. No legal action has been undertaken during 1910, but I have given instructions to your sanitary officials to make the necessary provisions for the effective carrying out of the Act in the future."

TARVIN RURAL DISTRICT:—

"The house accommodation is adequate, as a rule, and very few of the houses are unfit for habitation. There is sufficiency of open space and the cleanliness of surroundings, though in some individual cases not pre-eminent, leaves little to be desired.

"There is no supervision on the part of your Council over the erection of new houses, except as regards the water-supply of the proposed house."

WIRRAL RURAL DISTRICT:—

"So far as my observations go there are practically no unoccupied cottages in the Rural District. Very many of the houses for the working-classes are modern and well built with plenty of air space and garden ground. Here and there, more especially in the older villages, cottages exist which are below the standard demanded by present day requirements. Your Council have made arrangements for a systematic house inspection as required by the Housing and Town Planning Act, 1909. The erection of new houses is supervised in every detail by your building Surveyor."

SECTION V.—Midwives Act, 1902.

The scheme in operation in the Administrative County has been fully described in previous Reports.

At the close of the year 1909, there were 502 midwives on the County Register. During 1910, there were 75 names taken off the Register for various reasons—death, removal to another County, retirement, as a consequence of penal procedure of the Central Midwives Board, &c.—and 86 new names were added, thus bringing the net total up to 513 now on the County Register.

Of those midwives whose names have been removed from the Register, 40 were women who were in *bonâ-fide* practice in July, 1901, and 35 were women who had undergone the prescribed training. Of those midwives whose names have been added to the Register, 57 are women who have undergone the prescribed training, and 29 are women who were in *bonâ-fide* practice in July, 1901.

The number of properly trained midwives now practising in the Administrative County is thus brought up to 180, as compared with 156 for 1909, and 120 for 1908.

The number of midwives who have been trained and certified at a Training School approved by the Central Midwives Board is thus 35.08 per cent. of the total number on the County Register, as compared with 31 per cent. in 1909, 25.64 per cent. in 1908, 23.67 per cent. in 1907, and 21 per cent. in 1906, a distinctly gratifying increase, and one which would have been slightly higher but for the facts contained in the next paragraph.

Under a new Rule of the Central Midwives Board women in *bonâ-fide* practice in 1901, and who had for some reason satisfactory to that Board, failed to register in accordance with the Act, were given another chance to be placed on the Register, provided their applications were received by September 30th, 1910. This rule was made known to all the Medical Officers of Health concerned in the County, and was advertised in the County newspapers, the result being that 28 women, residing in Cheshire, succeeded in having their names registered. Of these, one has since died, and one does not now intend to practise. The applications of 11 such women were refused by the Central Midwives Board.

The number of midwives residing and practising in the several districts in the Administrative County at the close of 1910 is given in the following Table:—

MUNICIPAL BOROUGHES.

Congleton	14	Macclesfield	14
Crewe	32	Stalybridge	15
Dukinfield	13		
Hyde	30	Total	118

OTHER URBAN DISTRICTS.

Alderley Edge	2	Hoyle and West Kirby	7
Alsager	3	Knutsford	4
Altrincham	12	Lymm	6
Ashton-upon-Mersey	5	Marple	0
Higher Bebington	2	Middlewich	4
Lower Bebington	4	Mottram	1
Bollington	3	Nantwich	3
Bowdon	1	Neston and Parkgate	5
Bredbury and Romiley	6	Northwich	15
Bromborough	1	Runcorn	12
Buglawton	6	Sale	7
Cheadle and Gatley	0	Sandbach	6
Compstall	1	Tarporley	0
Ellesmere Port and Whitby	5	Wallasey	49
Hale	3	Wilmslow	5
Handforth	2	Winsford	21
Hazel Grove and Bramhall	4	Ycardsley-cum-Whaley	2
Hollingworth	3		
Hoole	2	Total	212

RURAL DISTRICTS.

Bucklow	19	Northwich	24
Chester	9	Runcorn	26
Congleton	16	Tarvin	11
Disley	1	Tintwistle	1
Macclesfield	12	Wirral	15
Malpas	6		
Nantwich	21	Total	161

The total number of midwives residing in the County and whose names appear on the County Register at the close of 1910 is therefore 491.

In the following districts there are no midwives practising—Cheadle and Gatley Urban, Marple Urban and Tarporley Urban.

The following particulars are summarised from the special Reports of the Medical Officers of Health.

(a) Cases attended by Midwives.—The total number of cases attended by midwives in the Administrative County during 1910 was 10,099, a considerable increase on the figure for 1909. The total number of births registered in the

Administrative County was 15,273. From this it appears that midwives attended approximately 66 per cent. of the total births in the County. This is a figure which shows an increase on previous years, being 7 per cent. more than in 1909.

(b) Keeping of Case Books, &c.—In all districts practically the whole of the midwives keep case books or registers, but a few illiterate women who cannot either read or write, naturally do not concern themselves with such records. In some cases of illiteracy the midwives keep case books and registers and rely upon the assistance of relatives and friends to keep them entered up. In eight instances it is stated that case books are not kept or are not entered up to date.

(c) Records of sending for Medical help.—It appears that in 1080 cases medical help was summoned by the midwife. Taking the total number of cases attended by midwives as 10,099, this gives the percentage of cases in which they deemed it advisable to summon medical help as 10.7, a somewhat low figure.

As instancing the variations in this matter in the different districts two extreme cases may be cited.

In Dukinfield there were 426 cases attended by midwives, and 131 records of sending for medical help; whereas in Crewe out of 918 cases there were only 13 such records. The state of affairs in Crewe appears to call for special inquiry.

(d) Taking of Pulse and Temperature.—The remarks under this heading are of various characters, and probably afford the best index obtainable to the capability of the midwives practising in the County.

In the Borough of Congleton it is stated that “some record abnormal temperatures but not pulse, one records temperature whether abnormal or not, and the five who cannot write record neither.”

In Crewe it is stated that “the majority are unable to do so.”

In Dukinfield, in nearly every case this is done; “one or two are making hopeless endeavours to do so.”

In Stalybridge it is stated “that this is not systematically done, but only when the temperature is abnormal.” This must

obviously refer to the recording and not to the taking of the temperature.

In Ashton-upon-Mersey it is stated that "this is not done."

At Bowdon the midwives do not carry out this rule.

In Bredbury and Romiley "nearly all take the temperature but not the pulse."

Again in Buglawton Urban District it is stated that "the midwives record temperature when abnormal but not pulse."

In Compstall Urban District there is only one midwife and she has now been instructed to take the pulse, "but cannot take the temperature properly yet."

In Lymm "three take temperature, none take pulse, but no record is kept."

The Mottram midwife is deficient in both respects.

In the Nantwich Urban District it is stated that two of the three midwives are not capable of taking pulse and temperature.

In the Northwich Urban District the midwives do not observe the rule.

In the Wallasey Urban District it is stated that "all assert that they take the temperature, and about 50% record it."

In Wilmslow Urban District all the midwives carry out these duties with one exception.

In Winsford it is stated that "thermometers and catheters are beyond the capacity of many of the midwives."

In Congleton Rural District it is stated that these duties are not regularly done, because of the ignorance of the midwives.

In Malpas Rural District it is remarked "that complete ignorance of the use of the thermometer and the taking of the pulse seems to prevail."

In the Runcorn Rural District it is stated "that most of the midwives think the rule only applies to those cases that are going wrong."

In quite a number of instances it is stated point blank by the Medical Officer of Health that the midwives do not record pulse or temperature.

In several cases it is reported that the midwives *say* they take and record pulse and temperature. It is the duty of the Medical Officer of Health under the scheme propounded by the County Council to inspect the case books of the midwives, and this inspection should reveal whether pulse and temperature are taken and recorded in every instance.

Attention must be called in the plainest manner to this disclosure of crass and dangerous ignorance. Medical Officers of Health are reminded that midwives who cannot take pulse and temperature are bound to contravene at times the rules of the Central Midwives Board, and it is their duty to report to the County Medical Officer of Health all cases where midwives do not comply with these rules. It is impossible for a midwife to comply with the rule as to the sending for medical assistance when the temperature is above 100.4, or there is a quickening of the pulse, unless the midwife can take pulse and temperature, and inasmuch as possible death from puerperal fever is involved, the matter is a most serious one.

(e) **Appliances.**—The large majority of the replies to the enquiry as to whether the appliances required by the rules to be kept by each midwife are actually provided and kept clean and in good order, are in the affirmative.

In Macclesfield it is stated “that this is improving every year.”

In Stalybridge, Dr. Hancock says:—“A few are without catheters, and in my opinion better without them.”

In Nantwich Urban District it is stated that “this is only satisfactory in one case.”

In the Nantwich Rural District, Dr. Turner says that “the untrained women take only an antiseptic, a nail-brush, and soap with them.”

It may be stated generally that most of the illiterate midwives either do not possess or cannot reliably use catheters or vaginal douches, and the Medical Officers generally hold that this type of woman are better without such appliances.

(f) Means of Disinfection.—The facilities afforded in the various districts for the disinfection of midwives who have been attending cases of puerperal fever or other infectious disease, or cases in which there are foul smelling discharges, vary very considerably. For these, therefore, as well as for other purposes, it is very desirable that districts at present unprovided with means of disinfecting the clothing of the midwives practising in their areas should make arrangements to this end as early as possible. The following districts have no such provision, viz., Alsager, Ashton-upon-Mersey, Higher Bebington, Bollington, Bowdon, Compstall, Ellesmere Port, Hale, Handforth, Knutsford, Lymm, Middlewich, Mottram, Neston, Runcorn, Sale, Sandbach, Winsford, Yardsley, Bucklow Rural, Congleton Rural, Disley Rural, Malpas Rural, Tintwistle Rural, and Wirral Rural.

(g) Puerperal Fever.—In 27 instances throughout the whole of the Administrative County cases of puerperal fever are known to have arisen in cases attended by registered midwives. The Medical Officers of Health have uniformly carried out the most rigorous measures on the occurrence of such disease in the practice of a midwife.

(h) Penal Procedure.—Nine reports were submitted to the Midwives Act Committee in regard to the following matters ; 1 for general incompetence, 2 as to unregistered women acting as midwives, 2 for neglect, 1 for neglect and intemperance, 2 for not sending for medical help and 1 for employing an uncertified substitute. Six of these cases were severely reprimanded by the Committee, 2 cautioned by the Central Midwives Board and the name of the midwife guilty of neglect and intemperance was removed from the Roll.

Proceedings were taken against an unqualified woman at Marple for acting as a midwife, and a conviction secured, the woman having to pay the costs of the case (£1 4s. 6d.)

(i) Shortage of Supply.—In Congleton Borough there are only 8 midwives out of 14 on the County Register who are really wishful to attend cases, and it is anticipated that very soon one or two of these will give up work, when the supply will become insufficient. The fees obtainable in Congleton are said to be much too low to induce properly trained midwives to settle in the district.

In Mottram Urban District there is only 1 midwife, and none in the Broadbottom part of it, which Dr. Awburn remarks "is a serious thing for the poorer people."

At Nantwich, 5 midwives have died or removed recently, and as there are only 3 residing in the town, two of whom are illiterate, there is a great shortage in the district.

In Bucklow Rural District "there is a shortage in some townships owing to lack of population to provide work for a midwife, but these few cases are all within reach of doctors."

There is a shortage in Dunham Hill, in the Chester Rural District.

In Congleton Rural District there are midwives required at Smallwood and Mow Cop.

In Macclesfield Rural District for the present it is not anticipated that very great inconvenience will be caused, but in a few years as the old midwives give up work, there will undoubtedly be great difficulty if the Act is to be rigidly enforced. The Medical Officer of Health states that in this widely scattered district the "handy woman" is of great value. There is not enough regular work of this kind for anyone, and few women would be charitable enough to undergo the severe hardships often necessitated by this work in the hills for the few shillings received.

There is still some shortage in Nantwich Rural District, but Dr. Turner states that it has been largely remedied by the district nursing scheme and by 2 additions to the Midwives Roll.

In Northwich Rural Area, Weaverham District suffers from lack of midwives.

In the Runcorn Rural District the Medical Officer of Health remarks that he does not consider the district too well supplied with midwives. There are 26 midwives in the district, which has a population of 25,700, that is slightly over one midwife per thousand.

The combination of district nursing with midwifery is aiding largely the solution of this problem of shortage. In many areas there is not enough work to maintain a woman who depends on midwifery alone.

The year 1910 signalled the coming into complete operation of the Midwives Act, and in view of possible shortage over 500 women throughout England and Wales who had been in bonâ-fide practice, but for some reason or another had failed to register, were placed on the Roll—a concession which, though dictated by humanitarian motives, will set back the clock of progress some years. It is sincerely to be hoped that a sufficient number of women will take up proper training and thus avoid the necessity for any repetition of this procedure.

SECTION VI.—Water Supply.

THE BOROUGH OF CONGLETON derives its supply from springs in the quicksands on the west side of the Pumping Station at Forge Lane within the Borough. It is stated that there are only a few isolated farms in the district which are not supplied from the mains.

CREWE obtains its water from the L. & N. W. Ry. Co. by purchase, the water being originally obtained from deep wells in the new red sandstone at Whitmore in Staffordshire. It is stated to be somewhat hard for domestic purposes.

DUKINFIELD obtains its supply from wells, springs and streams in the Swineshaw district, the works being owned by a Joint Waterworks Committee consisting of the Boroughs of Dukinfield, Ashton-under-Lyme, Mossley and Stalybridge. It is stated that one new reservoir has recently been completed, and the construction of an additional reservoir in the Chew Valley to hold about 200 million gallons is now proceeding. The water comes at present from wells, springs and streams in the Swineshaw valley, and is free from risk of pollution.

THE HYDE supply is from the Manchester Corporation (Woodhead reservoirs), but the higher parts of Gee Cross and Newton do not obtain their supply from this source, though works are now in progress, and will soon be completed, to carry the Woodhead water to these portions of the Borough.

Dr. Marsh reports of the Borough of Macclesfield, that :—

“Our water-supply has been abundant and of good quality during the year. Almost the whole of the town is now supplied with filtered water. A new main has been laid from the recently erected filter in Buxton Road, and from this main the upper reaches of Buxton Road are supplied, and a branch has been carried down Blakelow Road and Upper Hollins Road, thus supplying the houses in these roads with filtered water, where previously it had been obtained unfiltered, directly drawn from the Langley main. Investigations recently carried out by Dr. Houston for the London Water Board have proved that the storage of water for some days exercises a valuable purifying effect on comparatively foul specimens. The settling or sedimentation which occurs when large volumes of water are allowed to stand for some days, appears to carry down the great majority of bacteria so that the upper stratum of water

is left comparatively free from suspended impurities. This points to the need for having as large a storage area as possible."

STALYBRIDGE obtains its water from the works of the Joint Waterworks Committee mentioned in connection with the Dukinfield supply. The supply at Stalybridge is almost entirely derived from the Brushes reservoir, but portions of this Borough, namely, Heyrod, Hough Hill, and the district of Mottram Road above Bower Fold, are supplied from the Lower Swineshaw reservoir. Both the Brushes reservoir and the Lower Swineshaw reservoirs are supplied by the Higher Swineshaw reservoir. It is stated that the present capacity of the reservoirs owned by the Joint Waterworks Committee is about 900 million gallons.

ALDERLEY EDGE obtains its water-supply from the Stockport Corporation.

In connection with the ALSAGER supply the Medical Officer of Health reports:—

"This is from the same source as before. An alteration has been made in the well and part of the water has been tubed out.

"A specimen of the water used for public supply has been analysed and reported on as "a good water—though hard—and fit for domestic use." The supply is efficient.

"During the year the tap from the Alsager water-supply in Linley has been made good use of. The Council have built a tank on the hill in Linley capable of containing 5,400 gallons, which is considered sufficient to supply about 20 houses. From this a 3-inch main pipe conducts the water as far as the "Slate houses."

"This tank is supplied by water pumped from the Alsager water-supply at night. Owing to a difficulty with the pressure retaining valve the scheme has not yet been completed. When it has and the water laid on to the houses I should suggest that the wells be closed."

ALTRINCHAM URBAN DISTRICT is supplied by the mains of the North Cheshire Water Company, who derive their supply from the Manchester Waterworks. A number of houses which had hitherto only the use of a standpipe have now had an individual supply laid on.

The North Cheshire Water Company also supplies Ashton-upon-Mersey District. It is stated that a supply is needed to the extreme end of Carrington Lane where there are about 7 houses, and is also needed to a few of the outlying farms.

HIGHER BEBINGTON URBAN DISTRICT is supplied with water from the West Cheshire Water Works, this supply being from deep wells at Hooton and Prenton.

"The district is supplied with water by the West Cheshire Water Company. This water is good so far as organic purity is concerned, but its hardness is a great disadvantage, especially in a district such as yours where the livelihood of a number of the inhabitants is eked out by taking in washing. A recent analysis of the water shows a hardness of 17.75 degrees before boiling and 1.25 after boiling. This means an enormous deposit of lime salts in whatever boiler or kettle is employed. I understand that your Council approve of steps being taken to urge upon the Water Company the necessity of adopting some process of softening the water before it is delivered to consumers."

During the hearing of the West Cheshire Water Bill, 1911, powers were granted by a Committee of the House of Commons under which the Company will be required to soften the water derived from the Hooton wells down to 10 degrees (Clarke's scale) of hardness in the course of a very short time.

LOWER BEBINGTON is supplied from the same source as the above.

Water is furnished to the BOLLINGTON URBAN DISTRICT from two bore-holes at Rainow. There are still some 30 houses which are without a public supply, these being situate at too high a level. The amount of the supply is stated not to be sufficient and some shortage is anticipated.

Dr. Main reports as follows on this supply:—

"The water-supply for the district comes from the bore-holes at Dane Bent and Lowerhouse in the neighbouring parish of Rainow. In quality it has continued to be very pure and wholesome. As to quantity, there has been ample for the needs of the year. In this respect it has perhaps been fortunate that the last few years have all been noted for the wetness of their summers, and there has not been, for some considerable time, any long continued period of drought.

“That a very greatly increased supply of water is needed for the district, owing mainly to the introduction of the water carriage system of sewerage, is admitted, and further, that the amount now required is out of all comparison to what was considered necessary before is certain. Until a time of stress comes it is difficult to gauge how far the supply will stand it, but we cannot help awaiting such a time without a certain feeling of foreboding and anxiety.

“The Water Committee and Superintendent have carefully borne this very important matter in mind throughout the year. The check on wastage in the mills, which was found to be so serious last year, has been rigorously imposed and, no doubt, a great saving has been effected. There is still, however, the loss in the individual houses to be guarded against. It is not an uncommon thing on entering the different houses to find a leakage going on from the tap on the slopstone. Sometimes it is only a constant dripping, frequently it is a very decided flow of water. This sort of thing going on in a fair percentage of the houses must, in the aggregate, make a bigger loss than at first sight one would imagine.

“That this state of things is recognised by the Water Committee is seen by the fact that the Council’s men are at the call of householders at any time to supply and fit new washers to the taps free of charge. Something further is, however, still required, as all householders are not as careful as they should be to carry out this simple requisition. This is evidenced by the fact that one frequently sees a piece of old rag or dish-cloth tied round the leaking tap to prevent splashing and to mitigate somewhat the noise of the escaping water. On enquiry one learns that this state of affairs has frequently been going on for some few days.

“Whilst, however, guarding against wastage is good practice and most essential, it must not be imagined that this is the main end to be attained. So long as the ‘rainy day’ lasts, the difficulty is apt to be minimised. The important thing to be kept in view is not the rainy day but the period of dry days. Unfortunately, the rateable value of the district appears, at the present time, to shew a tendency to decline, and, in face of this, the difficulty of the Water Committee in looking for and obtaining new sources of supply is greatly increased. It is, however, one of the most, if not the most, important matters that the Council has to deal with.”

The Sanitary Inspector adds:—

“The water-supply has been of sufficient quantity during the year, due to the wet summer experienced, but I am afraid that, with a normal summer and the increasing number of water closets, the supply will be insufficient for a continuous supply. There have been slight complaints of the quality of the water, due to the water becoming stale in the iron main between Dane Bent reservoir and the 7-in. main from the Lowerhouse works. The former supply comes into use automatically with the reduction of pressure from Lowerhouse supply, but the cause of complaint might be avoided by flushing the main in question if it was possible to ascertain when the Dane Bent supply was going to come into use.”

The BOWDON URBAN DISTRICT is supplied by the North Cheshire Water Company, which obtains it from the Manchester Corporation.

In BREDBURY AND ROMILEY the Manchester Corporation furnish the supply, only a few of the outlying parts obtaining their water from private wells. The water mains are extended from time to time as new buildings are erected provided the distance is a reasonable one.

Dr. Cant reports:—

“The water-supply which has been mentioned in all my previous reports, has been definitely improved during 1910, and the prospects for the future are much brighter than ever before. Our supply comes from the Manchester Corporation reservoirs, at Woodhead, at present, but another source will be available in the near future, viz., the Stockport Corporation’s Kinder Waterworks, which, we are assured, will not only give us an ample supply, but will be able to deliver it at a height sufficient to supply the highest parts of the district. Further details of this scheme are given in the Sanitary Inspector’s report attached hereto. The quality of the Woodhead water is excellent, free from pollution, and having no appreciable plumbo-solvent action. Complaints have been made about a rusty deposit in some parts, and this has been found to be due to the old iron pipes. As the district grows these will probably be replaced by larger and newer ones.”

The Sanitary Inspector adds:—

“The whole of the district is supplied with water from the Manchester Corporation Reservoirs. The Council have

been informed by the Water Committee of the Stockport Corporation that they expect, in the near future, to give this Council a further supply from their new Kinder Waterworks, at a sufficient pressure to supply any properties in the highest parts of the Council's area, and during the past 12 months application has been made to the Local Government Board for sanction to borrow the sum of £3,442, and for which sanction has recently been received for the sum of £3,382, for the laying down of a new 8in. water main from Dooley Lane to Barrack Hill, with meter house and other work in connection therewith. The Water Committee are of opinion that when this scheme is carried out the district will have a sufficient supply of water to serve any part of the Council's district for some considerable time to come. The water mains have been extended as follows, viz.: 353 lin. yards of 4ins. in Birch Vale Road, Romiley; and 210 lin. yards of 3ins. in Red House Lane, Bredbury. The above 2 mains are now working in circuit. A 3in. water main from Pole Acre Lane to the Unity Mill, a distance of 264 lin. yards, has been put down. Only on one occasion during the year has a sample of water been analysed, and this was reported to be fit for domestic use, if passed through a filter, but a supply from the Council's main has since been laid on to the premises, in lieu of the private source of water."

BROMBOROUGH URBAN DISTRICT continues to obtain its water from two sources, the upper part of the district from the mains of the West Cheshire Water Company and the Pool Works village from the proprietors' own Waterworks. In both cases the water is derived from deep wells. Every house in this district is supplied with water from either one or other of these sources. The hardness of the former is complained of.

In BUGLAWTON the source of the supply is certain springs on Cloud Side. Many farms, however, have their own supply from springs or wells.

Dr. Davidson states that:—

"The water-supply was satisfactory so far as purity was concerned, and sufficient for the urban parts of the district at all times, but in dry weather the rural portions are occasionally insufficiently supplied, and it is doubtful whether, in case of fire, the pressure would be sufficient to be of much use. There is abundance of excellent water in the neighbourhood of where the present supply is derived

from, and it is understood negotiations are going on for acquiring more."

CHEADLE AND GATLEY URBAN DISTRICT derive their water-supply from the Stockport Corporation with the exception of a very few houses which are supplied by wells.

The COMPSTALL URBAN DISTRICT is supplied with water from certain upland springs. A few parts of the district are still without an adequate supply.

ELLESMERE PORT AND WHITBY is supplied by the West Cheshire Waterworks Company.

Dr. Yeoman reports that:—

"The rapid growth of the town has led to complaints of insufficiency of water pressure and the Company have undertaken to remedy this grievance. The water supplied is exceedingly hard and costly to use. Its source is from deep wells in the new red sandstone."

The URBAN DISTRICT OF HALE is almost entirely supplied from the Manchester Corporation reservoirs at Woodhead, and the supply is stated to be satisfactory in all respects. Some parts of the district are dependent on springs, but this will it is hoped be altered very shortly.

The HAZEL GROVE AND BRAMHALL supply is obtained from the Stockport Corporation (Lyme supply).

HANDFORTH URBAN DISTRICT obtains its supply from the same Corporation.

The URBAN DISTRICT OF HOLLINGWORTH is supplied well and abundantly from the Manchester Corporation reservoirs at Arnfield springs. The water is slightly acid and must therefore possess plumbo-solvent properties, but service pipes are stated to be well tinned and no trace of lead has ever been found.

HOOLE URBAN DISTRICT obtains its water from the Chester Waterworks Company.

The supply of HOYLAKE AND WEST KIRBY is from deep wells. It is said that there are no parts of the district without a proper supply.

Dr. Yeoman reports:—

"The entire district is well supplied with water by the Hoylake and West Kirby Gas and Water Co., Ltd. The

source of supply is deep wells in the new red sandstone at Grange Hill and Newton. The analyst to the Company reports that "the samples contained no organisms or pathogenic germs." The results of analyses compared with those of previous years indicate that the extremely high state of organic purity, together with the other excellent qualities of the waters, remains unchanged."

KNUTSFORD obtains its water from the impounding of a small stream which rises on Alderley Edge about 8 miles away. It is stated that the quantity is sufficient, but that the quality is not satisfactory on chemical analysis, due to unavoidable pollution from certain agricultural land through which the stream passes. No outbreak of illness is said to have ever occurred which could be attributed to this supply.

Dr. Garstang reports that:—

"The gathering-ground has been subjected to constant inspection by the Water Company and also by the Council. The Macclesfield Rural District Council has a scheme for sewage works for the village of Chelford, the effluent from which would be discharged into the Pedley Brook. This should be vigorously opposed; but at the same time that Authority should be pressed to carry out the scheme on another site, draining in a different direction, as the existing pollution is too serious to be allowed to continue."

It is understood that the Company are about to instal an ozone purification apparatus at once.

The URBAN DISTRICT OF LYMM is supplied by the Lymm Water Company, whose Works and Pumping Station are at the north end of Lymm Lake.

The water-supply of MARPLE comes from the Stockport Corporation (Lyne supply). Quite recently a Local Government Board Enquiry was held for the purposes of borrowing £220 for works of water-supply is Windlehurst Road. The water is bought in bulk from the Stockport Corporation at the rate of 8d. per thousand gallons, this being a fixed price under the Stockport Corporation Act of 1899. This scheme was not one intended to increase the area of supply, but merely to improve the existing supply. A further and probably better supply is being obtained from the Stockport Corporation Kinder scheme. The Navy Spout which supplies about 10 houses is open to suspicion and will need careful watching.

Dr. Burton reports as follows:—

“The water-supply of Marple is derived from the Cheshire and Derbyshire hills, collected into reservoirs at Lyme and later at Kinder, and belonging to the Stockport Corporation. The supply was very precarious in dry seasons, but is now quite satisfactory owing to a new engine being installed, which can pump much more water into our own reserve, and we now obtain a more regular and copious supply.

“The Stockport Corporation have constructed a 24in. water main, in connection with their Kinder scheme, which passes through High Lane, and our Surveyor has put in a 12in. branch to carry the water to our reservoir.

“The water is pure and good, and there have been no complaints this year. I understand that the Great Central Railway Co. are piping water from our mains to the cottage, the supply to which was condemned last year.”

MIDDLEWICH URBAN DISTRICT is supplied from deep wells at Delamere. Only 6 houses a long way from mains are without a constant supply.

MOTTRAM-IN-LONGDENDALE obtains its supply from the Manchester Corporation reservoirs, Arnfield springs.

The NANTWICH URBAN DISTRICT at present obtains a supply from the Baddiley Waterworks. Application has been made to the Local Government Board for sanction to a loan for a new scheme for water-supply, and it is hoped that the necessary works will very shortly be commenced.

NESTON AND PARKGATE URBAN DISTRICT continues to have a supply of good water from its own deep wells.

Dr. Yeoman reports that:—

“There is a good supply of excellent water derived from deep wells in the new red sandstone. The works are the property of the Council. All the houses in the district are supplied with this water with the following exceptions:

2 cottages from a surface water well.

2 cottages from springs.

2 cottages carrying the water half a mile from the public supply.

“The ten new houses erected have been supplied with water by the Council. 170 yards of 3in. cast iron water main and 230 yards of 2in. have been laid during the year.

“A recent analysis shows that there are 13 degrees of hardness before boiling, and this is reduced to 4 degrees by boiling. The analyst’s certificate states that it is a hard but first class water.”

NORTHWICH URBAN DISTRICT obtains the whole of its domestic water-supply from Cotebrook. In addition to this there is a trade supply from both Castle Wells and Wadebrook. The domestic water is hard, but is said to be of great purity. The mains in the higher parts of the district have been rearranged recently with great benefit. No further developments, it is stated, are needed at present.

The RUNCORN URBAN DISTRICT is supplied from the Council’s own waterworks, which were purchased from the company previously owning them in 1893. The adjoining districts of Halton and Weston are also supplied.

The URBAN DISTRICT OF SALE is supplied by the North Cheshire Water Company.

SANDBACH URBAN DISTRICT.—This comes from an upland source by 2 mains, 10 and 7 inch (one being used at a time), to the waterworks, where it is treated by Clarke’s process, and is a constant supply all over our district. It is a very good sound water in every way.

The town of TARPORLEY and part of Rushton is supplied from the Liverpool Vyrnwy supply which traverses the district. This being a soft water great care is necessary in the use of long lengths of lead piping for house services. Portions of Eaton and Utkinton are supplied with water by gravitation by springs. Other parts of the district are supplied from ordinary wells or springs.

WALLASEY URBAN DISTRICT has two supplies, one from deep wells or borings in the red sandstone, and the second from the Liverpool Corporation (Lake Vyrnwy) supply.

WILMSLOW obtains its water from the Stockport Corporation from deep boreholes in the new red sandstone. Parts of Morley and the Hough are still without a proper supply. Endeavours have been made to obtain an improved supply for certain houses in Strawberry Lane, but the opinion of the County Analyst was not sufficiently definite to enable proceedings to be taken with any hope of success.

"The water supplied by the Stockport Corporation is obtained in Wilmslow from boreholes in the new red sandstone. Before distribution it is submitted to a softening process, in which lime only is used, in a plant called the Archbutt-Deely. As raised from the boreholes, the hardness is 14 degrees (Clarke's scale). After treatment the hardness is 7 degrees. The supply is good and ample for all requirements. Some parts of the rural area are supplied from wells. No complaints have been made during the year."

The WINSFORD supply is said to be from springs of good quality, and free from liability to pollution. The supply is said to be excellent and constant and all parts of the district supplied.

YEARDSEY-CUM-WHALEY URBAN DISTRICT derives its supply from the Stone Head and Diglee reservoirs.

The greater part of the BUCKLOW RURAL DISTRICT is supplied from the mains of the North Cheshire Water Co. The remainder is supplied by the Stockport Corporation and the Knutsford Water Co. Several townships depend for a supply on local wells. During 1909, the Township of Dunham Town has been favoured by an extension of the mains of this Company, which was necessitated by the failure of the wells caused by the disturbance of sub-soil water during the construction of a new and deep sewer.

"All public supplies are constant. The North Cheshire Water Co. buys in bulk from the Manchester Corporation and supplies parts of Dunham Massey, Ashley, Timperley, Baguley and Northenden, also one or two houses in Ringway; a few houses in Carrington and Partington are supplied from Manchester direct; a few houses in Tabley Superior and Bexton are supplied by the Knutsford Water Co.; part of Styal and a few houses in Northen Etehells are supplied from the Stockport Corporation's mains; the remaining parts of the townships named, and all the other townships not named, 18 in number, have no public water-supply. The geological formation is such that no water-bearing stratum exists. The population of these areas is small and scattered, and no large schemes of supply are within the bounds of financial possibility. The private supplies are derived from surface wells. In a few cases these wells pass through a stratum of clay, and reach water underneath it (which is of good quality), but not in greater amount than suffices for the users of the particular well.

"Water certificates were granted for 72 houses under the provisions of the Public Health (Water) Act, 1878, Section 6

Where the water-supply was from wells, samples were submitted to the County Analyst, and a satisfactory report obtained before the houses were occupied or certificate granted. Where filtration was recommended by the Analyst, the usual practice of requiring the owner to provide a Pasteur-Chamberland filter for each house was adopted. When it was found impossible to obtain a good supply from wells, rain water tanks of adequate capacity were provided. The houses in Dunham Town have now been provided with water from the new main of the North Cheshire Water Co., laid down at the end of 1909.

“A scheme for further extension of water mains to Woodhouses and Dunham Massey Station is now receiving the consideration of the Water Committee. A further extension to Lowerhouses is also contemplated.”

The Rural part of CHESTER obtains its water partly from Chester Waterworks Company, partly from the Wrexham Waterworks and partly from the West Cheshire Waterworks Company. The former Company are now engaged in laying a main to supply Backford.

Elsewhere (Mickle Trafford, Bridge Trafford and Dunham Hill) the water is unsuitable or deficient in quantity.

Christleton, Newton and Upton, are supplied from the Chester Waterworks.

Great Saughall, Capenhurst, part of Mollington and Backford, are supplied from the Wirral Waterworks.

Dodleston and Eaton are supplied from Wrexham Waterworks.

Part of the district is traversed by a large conduit taking water from Vyrnwy to Wallasey, and a few houses have been supplied therefrom.

CONGLETON RURAL DISTRICT is supplied from the Sandbach Waterworks and from the Mow Cop, Staffordshire and Middlewich Waterworks Company. Holmes Chapel is still without an adequate supply, although a Local Government Board Enquiry has recently been held to enable the supply to be carried from Middlewich to this place. Part of Mow Cop and Mostyn are still without a proper supply.

The DISLEY RURAL DISTRICT obtains its supply from the Stockport Corporation (Lyme supply). Part of Furness Vale (about 12 houses) is still without an adequate supply.

MACCLESFIELD RURAL DISTRICT obtains water from a large number of sources, chiefly from springs and wells. Owing to the scattered nature of the population it is not easily possible to provide a public supply at a reasonable cost. Some progress, however, is being made in this direction, and 11 townships are now partly supplied from waterworks which are stated to be of a more or less public character.

THE MALPAS RURAL DISTRICT is traversed by the Liverpool Vyrnwy mains, and is largely supplied from this source.

Dr. Leigh states in his report that :—

“The water-supply to the town of Malpas, and Bickley, is from the Liverpool Mains.

“Two repairs have been made to the existing water-supply.

“No case of deficient water-supply has been reported.

“In other portions of the district the usual source is from wells.”

IN THE NANTWICH RURAL DISTRICT the work of connecting further houses to mains has been continued. Extensions have recently been carried out to Chorley Green and Dig Lane. A scheme has been in progress for some little time for supplying Audlem and 10 other townships from the Liverpool mains.

Dr. Turner states that :—

“The report of the Surveyor will show what has been accomplished in the matter of public water-supply during the year. The hamlet of Englesca Brook (Weston) is in need of a public supply. Most of the pumps are out of repair and the one pump which is regarded by the inhabitants as being above suspicion is reported by the County Analyst as providing a water showing signs of sewage pollution. Many of the people drink water from the brook, a source of supply which is open to many gross pollutions.

“No progress has been made in the matter of providing a public supply of water for Audlem and the adjoining townships ; nor will any real progress be made until the Rural District Council ceases to take notice of the local differences of opinion reflected in the communications from the Audlem Parish Council

In my opinion it is the duty of the Rural District Council, as the Sanitary Authority, to take a firm stand, to form an opinion as to what is necessary for the township, and to carry it out regardless of the opinions of a vociferous few residents of Audlem, whose opposition can never be appeased and whose private water supplies are in some cases not too plentiful or pure."

The Surveyor adds :—

"No new water mains have been laid during 1910; the total length of mains laid in the Rural District remaining at the same total as last year, namely 288,343 yards, or 163 miles and 1463 yards (mains laid by private owners prior to 1901 are not included in this total).

"Twenty-eight new houses have been connected to the water-mains during the year, making a total of 3,620 houses supplied by the Council's water-mains since 1879, after deducting the houses in Wistaston, Shavington, and Church Coppenhall, now forming part of the Borough of Crewe.

"The quantity of water consumed in the Rural District during 1910 amounted to 81,593,000 gallons, and in addition to this 1,663,000 gallons were supplied to Bickley township for the Malpas Rural District Council. The consumption of water per house per day for the year was 61·8 gallons and the consumption per head of population per day was 11·9 gallons.

"The Stapeley Waterworks again gave satisfaction during the year; but the supply at times had to be supplemented by means of the other mains laid in that Township.

"Plans and estimates for the proposed Brindley, Burland and Faddiley water-supply were sent up to the Local Government Board, and an Inquiry was held in February of last year. A doubt has been expressed by the Local Government Board that the 3-in. main proposed would not be sufficiently large to supply the district in question, and also exception was taken to the probable effect the scheme might have upon the supply to Ridley Bank Farm, which is the highest point supplied with water in the District; several methods of obviating this were suggested, and the Council ultimately decided to put an alternative suggestion before the Local Government Board, viz., to extend the 5 in. main in Cholmondeley to Cholmondeley Schools, and there to disconnect the present 3-in. main from Croxton Green and the Chorley mains, the additional cost of

which would be £500. The Local Government Board further suggested 5-in. and 6-in. mains through Chorley, but the Council were unable to agree to this as the cost would be fatal to the scheme. The available head on the 3-in. mains proposed would suffice to supply more than twenty times the amount of water that would be required for the townships of Brindley, Burland, and Faddiley, and a long experience of 3-in. mains in this District leaves no doubt as to their sufficiency in the present case. It is hoped that the Board will ultimately see their way to permit the scheme to be carried out, and thus confer the benefit of a pure and abundant water supply on these townships.

“The Audlem and District water scheme has progressed very little during the past twelve months.”

The NORTHWICH RURAL DISTRICT obtains supplies from several sources, viz. : the Liverpool Corporation and the Urban District Councils of Northwich, Middlewich and Winsford, and six other works the property of the District Council. In several townships the supply is from springs, being pumped by steam or oil engines.

Dr. Gough reports as follows :—

“The water supply is derived from the Liverpool Corporation, the Northwich Urban, Middlewich Urban and Winsford Urban Districts, and six other works are in connection with local springs :—

Sandiway, Cuddington and Hartford.—Water Tower, Reservoir and 3 Engines.

Barnton.—Tower, Reservoir and Engine.

Weaverham and Acton.—Tower and Engine.

Moulton, Davenham and Leftwich.—Tower and Engine.

Lostock.—Tower and Engine.

Anderton.—Spring with conduit to houses.

“Eleven samples of water have been analysed during the year, one bacteriologically as well as chemically ; as a result 2 were found bad and closed for domestic use, 3 doubtful ; these have been again sent for analysis. No complaints of action on lead have been received and no immediate developments are required, as only isolated farms and cottages are without a proper supply, i.e., without fetching it.”

Mr. H. J. Bennett (Surveyor), adds :—

“The water-supply is a considerable factor in the Council's work. I have under careful management 4 steam engines, 2 oil

engines and 1 turbine pumping water from local sources, and 1 extensive and important gravitation works. Water is also obtained from Liverpool mains and from Winsford, Northwich and Middlewich Urban Councils. We have 77 miles of mains in 23 townships, and 3,680 houses have a constant and abundant supply of good water."

The RUNCORN RURAL DISTRICT has several excellent public supplies, namely the Liverpool Vyrnwy Water, Warrington Corporation Water, Frodsham and Frodsham Lordship Waterworks, the Helsby and District Water Co., and the Runcorn Urban District Council supply.

Dr. Adams reports at some length on this important matter:—

"In the Runcorn Rural District there are 41 Townships, several of which abut upon adjacent Urban areas, and from these adjacent areas, derive an effective and continuous water-supply; the remaining Townships are dependent upon such water-supplies as are afforded by (a) rain, (b) wells (surface, generally), (c) springs (very rare), and (d) running brooks; all these natural supplies are, on the whole, unsatisfactory. The nature of the drinking waters derived from such supplies has been recorded in the series of annual Reports which I have presented to your Council, and to the Local Government Board, and the Cheshire County Council, for several years past. In my report for 1903, I dealt in detail with this question, and very slight alterations have taken place, in reference to water-supplies, since then—seven years ago. The changes and alterations have mainly been concerned with additions of further premises connected up to the Public water-supply.

"This Rural District, situated as a rough triangle, with Runcorn, Chester and Warrington, as relative apices of the triangle, happens to be very fortunate in its opportunities of deriving extraneous aid from other districts, to supply its needs of water-supply.

"The district contains 41 Townships, 22 of which are supplied with a constant supply of drinking water.

"The chemical analyses of all these waters indicate that the sources of supply are as good as can be obtained, whether derived from outside areas or obtained within the area of your own district.

"As this is the first report submitted under the Local Government Board's recent Order, it may be advisable that I

should enlarge into details of water-supplies, for purposes of official informations, viz :—

“A semi-rural area, such as is your Council’s area, of 41 Townships, must regard itself as peculiarly fortunate, if it can, in a period of 20 years, supply 22 out of its 41 Townships, with a constant supply of perfect drinking waters—and this is the task which your Council has achieved, greatly to its credit.

“To attain these results, assistance has been obtained from other Corporate bodies, who were in possession of adequate and pure water supplies, both within and outside the area of your District.

“These sources of supply are five in number, and I propose to set out the five sources, and to specify the areas within your District which they supply as follows :—

“(a) The Liverpool Vyrnwy water scheme passes direct through your District (embouching into the open, for reasons of hydraulic pressure, etc., at Norton Water Tower), and your Council has called upon it to supply several Townships within your District (a) Sutton ; (b) part of Aston ; (c) as much of Dutton as can be reached by this supply (or cost preventing further extension), and this includes the Isolation Hospital, and also various portions of Preston Brook, which lie within the field of distribution.

“(b) The Warrington Corporation Waterworks. This body has extended its water-mains into your district, to a very considerable extent, and has practically supplied the whole of—

(a) Stockton Heath.

(b) Walton Inferior (excepting a few houses out of available reach of this supply).

(c) Walton Superior (practically the entire Township).

(d) Moore (almost the entire Township).

(e) The greater portion of Acton Grange.

(f) The greater portion of Daresbury.

(g) The greater portion of Latchford Without.

(h) The greater portion of Thelwall.

(i) A considerable portion of Grappenhall :—The remaining portion of Grappenhall is, however, supplied by a private waterworks, which belongs to the principal land-owner in the township, and is erected and supplied at his own private expense.

“(e) The Frodsham and Frodsham Lordship Waterworks is a water company founded within your district, and supplies a most excellent water to the entire area comprised within its radius of supply as follows:—Frodsham, Frodsham Lordship (including the hamlets of Netherton, Overton, Bradley, Five Crosses and Woodhouses).

“(d) The Helsby and District Water Company supply the townships of Helsby and Alvanley with an excellent water, but no returns have been forwarded to me which will enable me to state that these townships are fully supplied.

“(e) The Runcorn Urban District Council has availed itself of the fortunate fact that the Liverpool Vyrnwy water scheme, passing within easy hail of its boundaries, has enabled it to supply the townships of Weston (including Weston Point), Halton and other adjacent areas within your district. This supply of a first-class water is much appreciated, and is a great improvement upon the former supply provided by the Runcorn Waterworks.”

In the TARVIN RURAL DISTRICT, Aldford, Churton and Saughton are supplied from the Wrexham Waterworks. Waverton is supplied from a well fitted with a windmill. Ashton village is supplied from springs in Delamere Forest. The township of Newton is still without an adequate supply. Although an endeavour has recently been made to obtain sanction for a loan, the scheme was not approved by the Local Government Board on engineering grounds. Beeston, Tilston Fearnall and Tiverton have their own works.

Dr. Moreton reports as under:—

“The water-supply of Aldford, Churton and Saughton is derived from Wrexham Waterworks. Waverton is supplied by a well, the water being raised by a windmill. Ashton is supplied from neighbouring springs. Beeston, Tilston and Tiverton have their own works. The public pumps and wells of the district are sufficient, the water is wholesome and the risks of pollution are not great except in the case of some open wells. It is proposed to make a special investigation into this question, and I invite any suggestion, either generally, or as applied to particular wells of which your members may have personal and practical knowledge. The well water is, as a rule, so pure and wholesome that it behoves a district, where water is not plentiful, to take special care of existing supplies.”

TINTWISTLE is supplied with water from a reservoir of its own, situated some three miles distant from the village. Certain new houses recently erected in Matley obtain a supply from a small reservoir in the hillside at Hurst Clough. Certain other parts of the District are dependent upon springs for their supply.

Dr. Awburn reports as under :—

“Tintwistle is supplied with water from its own reservoir, some three miles from the village, which is both plentiful and good. Matley is supplied from springs which run into a reservoir situated at Hurst Clough. This supply is also good. Hattersley.—This District is composed chiefly of small farms, each having its own water-supply from springs in close proximity to the house. No complaints have reached me with regard to any of the water from these springs.”

The WIRRAL RURAL DISTRICT is in general supplied from the West Cheshire Waterworks. Bidston-cum Ford and Noctorum obtain a supply from the Birkenhead Corporation, and Moreton and Saughall Massie are supplied by the West Kirby Waterworks. Although the District is traversed by the Liverpool Vyrnwy mains carrying water to Wallasey, no houses in Wirral are supplied from them. A few of the outlying places, namely Irby Mill Hill and some cottages between Higher Bebington and Brimstage have no proper supply of water.

Dr. Yeoman reports as under :—

“Two townships, viz., Prenton and Noctorum, are supplied by the Wirral Waterworks Company, and 29 Townships derive their supply from the West Cheshire Water Company. Moreton and Saughall Massie are supplied from the West Kirby Waterworks. Irby Mill Hill and Pensby, Newtown, are without any public supply.

“The water supplied by the West Cheshire and Wirral Companies is exceedingly hard. Some recent analyses give a total hardness of 19.0 on Clarke’s scale, which is reduced to 1.75 when boiled. This means an enormous deposit of lime salts in the domestic utensils in which the water is heated. The Water Companies should be required to soften the supply before delivery to the consumers, and your Council are taking steps to ensure compliance with what is a reasonable demand.

“A sample of water taken from a house on Irby Mill Hill was analysed, and the hardness was found to be 3.0 before boiling and 2.25 after boiling. The analyst’s certificate stated that it was a very soft water, of a very high degree of purity, and fit for domestic use.”

General Remarks.—Quite apart from the Commercial point of view of the enormous invested capital both public and private in waterworks undertakings (the loans sanctioned by the Local Government Board for water-supply purposes on the application of Urban and Rural District Councils in England and Wales during the ten years 1900 to 1909 amounted to no less than £6,394,212), there is the great importance of such undertakings to the public health. Whilst a marked lowering of the general death-rate has almost universally followed in the wake of an improved water-supply, there are instances enough of considerable outbreaks of enteric fever during the past few years which have been unquestionably caused by sewage-polluted water-supplies. To quote only some of the more serious recent epidemics the Tees Valley underwent one of enteric fever due to this cause in 1890 and 1891 in which 1,463 cases came under notice, Paisley in 1893 suffered under an outbreak involving about 800 cases, and again in 1898 from one in which about 280 cases occurred, Maidstone in 1897 had no fewer than 1,786 cases, Worthing 1,261 cases in 1893, Philadelphia 1,927 cases in 1897-8, and Lincoln in 1905 had close upon 1,000 cases.

This is by no means the whole tale, however, for it is beyond doubt that many isolated cases of enteric fever and many outbreaks too small to attract public attention have occurred and are likely to go on occurring which owe their origin to a contaminated water-supply. Enteric fever, of course, is not the only illness which is thus engendered by a polluted or vitiated water-supply, but the case based on enteric fever is so clear and specific that it affords the best argument for the necessity of measures of precaution. That a water-supply should be under all circumstances preserved from pollution has been for years accepted on all hands as the merest truism, but in spite of this thousands of cases of typhoid fever are seen to have occurred within the past 20 years amongst enlightened communities caused by more or less gross pollution. Although water has been primarily responsible for the more serious epidemics, several cases which have been before the Courts recently have demonstrated that its potentiality for mischief does not end amongst the direct consumers but may manifest itself in other quarters owing to contamination of milk and possibly other food products such as water-cress, shellfish, &c. River supplies, of which we have many in Cheshire, have been chief amongst the waters causing these outbreaks, and pollution of rivers directly or indirectly (particularly the latter) in such a way as to endanger water-supplies, though not in such a way as to render successful action possible under the Rivers Pollution Preven-

tion Acts, is one of the most difficult matters with which one has to deal. This has been borne in on me by a considerable number of inspections made recently in connection with your Council's opposition to the Chester Water Bill. Quite a large number of cases came to light during this inspection in which sewage-pollution from houses, or small groups of houses, was taking place of tributaries or sub-tributaries of the River Dee or ditches communicating often very indirectly and after considerable windings and wanderings through fields with this river. In a considerable number of these cases no one could with any show of reason attempt proceedings for breach of the Rivers Pollution Acts, but considered as possible sources of specific contamination of a public water-supply the case assumes a very different aspect indeed. The public are well protected in this particular instance by the elaborate precautions taken by the Water Company, and measures will, it is anticipated, be shortly carried out which will render the supply even safer still—indeed as safe as that furnished to the seven millions or more of people consuming London water.

The question is, however, is it enough from the broad point of view of public health to leave the precautions which shall be taken to ensure a pure and wholesome water-supply in the uncontrolled hands of Water Companies? True their reputation is always at stake, but the fact of their possessing compulsory areas of supply detracts somewhat from this argument, which is otherwise a quite genuine one to use. It is a moot point as to whether Water Companies are in the position of vendors under the Sale of Goods Act, and could be held liable for any implied breach of warranty that the article supplied by them was of good quality. Even granting that they are so liable the question of proving that reasonable diligence in the provision of a pure supply had not been exercised would in the case of certain forms of pollution be an exceedingly difficult one. The case is virtually the same on this issue where the water-supply is in the hands of the municipality or District Council. The most direct remedy against carelessness or negligence in such a matter as this would be to legalise the imposition of penalties at the instance of private consumers on either Companies or Sanitary Authorities who failed to supply pure and wholesome water without reasonable cause shewn, the onus of proof of purity or wholesomeness and of the employment of reasonable and proper diligence to rest on the body supplying the water.

It is submitted that a better and more universal standard of purity of water would be secured if all water undertakings

were under the supervision of some central representative and independent bodies such as County Councils, who should have powers of entry for purposes of inspection, of taking samples from reservoirs, filters, mains, &c., and of enforcing local measures for the prevention of pollution. It should be further made compulsory on all purveyors of water, public or private, to have frequent periodical and systematic chemical and bacteriological examinations carried out of all their sources of supply and of the water as delivered to the consumer from their works, and the Medical Officer of Health of the County Council and of any District Council within the limits of supply should at all times have free access to the records of such examinations, and should have power to call for copies of such records as he may deem it necessary to have on payment of a small fee to cover the clerical labour involved.

Some such course as this was advocated by Mr. Chaplin, when President of the Local Government Board in 1898, in connection with a number of Private Bills then before Parliament, but unfortunately no powers of this kind existed in any general Act of Parliament, and the objection was taken that for this reason such could not be conferred in any Private Bill. Clauses were subsequently suggested by the Local Government Board to cover the various points named, but so far they have not become law, and private consumers are thus left to the unsatisfactory remedy of waiting until the tardy opportunity arrives of bargaining with water-purveyors by the expensive process of opposing in Parliament any application for further powers which may chance to be made. Such leisurely and uncertain methods do not at all adequately meet the case. Quite enough is known nowadays of the serious actual and potential dangers of impure water-supplies and of the means of averting such dangers to justify Parliament in granting powers on the lines indicated above. The fact too that in a few instances at all events certain of these powers have been wrung out of Parliament in the face of strenuous opposition, and have been successfully operated without injury to the water-purveyors concerned is an additional argument for their speedy generalisation.

To pass to another aspect of this question of water-supply. In almost all districts, urban or rural, in the County, it is quite a common thing to find new houses being built outside the reach of a public water-supply and being compelled to sink wells for water. Such wells are sunk on the land which has been purchased for the site of the house, and they are sunk in such a situation and of such construction that a contaminated supply will almost certainly be the result either

immediately or after some little time. The Council of the district have no power of compelling any adherence to rules as to propriety of site or method of construction such as may prevent possibilities of pollution: the owner may put his well where he likes and build it as he likes, and, so long as he can shew temporary compliance with the requirements of the Public Health Water Act, 1878, in rural districts or in such urban districts as have adopted this Act, his well may within a very short time become as full of potentialities for mischief as it is of water. The inclusion of a Bye-law specifying the situation and mode of construction of a well to supply drinking water would, it is fairly certain, be struck out by the Local Government Board as outside the scope of the authority given by Section 157 of the Public Health Act, 1875, for the framing of Bye-laws. True the construction of cesspools, &c. within a certain distance of a well or source of water-supply may be prohibited under building Bye-laws, but I have never heard of a Bye-law prohibiting the subsequent construction of a well within any specified distance of a cesspool or other possible source of pollution. Here in my opinion a little elasticity in interpretation might usefully be extended to Local Authorities in the making of Bye-laws.

Some Authorities have issued suggestions with alternative schemes of planning as to the construction of wells and those I have seen have been uniformly good. In the absence of direct control this is as far as the matter can be carried at present.

In a large number of instances samples of water have been submitted to the County Analyst for analysis and report, and arrangements have now been made under which a copy of every such analysis is forwarded to me at the same time as it is furnished to the District Council requesting the analysis. Whilst this saves valuable time in most instances there are still a few Local Authorities who appear to think that the County Analyst will in some obscure manner be influenced in forming his opinion on the analytical results obtained by a knowledge of the source from which the sample has been taken. Although this is obviously a ludicrous inference the practice is still continued in some districts of labelling the samples with a mere number with the apparent idea that only in this way can an absolutely impartial opinion be obtained. This, looked at in the most obvious way, constitutes a fairly direct and totally unwarrantable aspersion on the methods of the County Analyst. As a matter of fact it might easily happen that the withholding of information as to the source of supply might lead to the formation of a

totally fallacious opinion on the suitability or otherwise of the water for domestic use: this has indeed happened in not a few instances within my knowledge.

It cannot be too strongly impressed that a knowledge of the source and surroundings of any water-supply is essential for the formation of a true opinion of its fitness or otherwise for consumption, and personally I would rather trust to an opinion formed as the result of careful local inspection than to one formed on chemical or bacteriological examination alone. Both chemical and bacteriological examination of water-supplies have their uses but also have their limitations. The 'personal equation' of the operator is a factor of considerable weight and it is by no means the only factor in the case. Lest I be misunderstood let me say at once that the chemist or bacteriologist who makes a single individual analysis of a water-supply without any knowledge of the source or surroundings may be and often is quite right in the interpretation he puts upon his findings, but he is almost as often liable to be quite wrong. The case is totally different with a chemist or bacteriologist who has for a considerable period carried out systematic and frequent analyses of a certain water whether he knows the source and surroundings or not: any departure from the average or normal contents at once strikes him and a proper note of warning will not fail to be sounded.

In a number of instances the certificate of the County Analyst has been, quite rightly from his point of view, to a somewhat doubtful effect: the case has proved to be, as regards the chemical contents of the water, on the borderline between safety and danger. In such cases as this a bacteriological examination, which necessarily delves more deeply into the constitution of the doubtful factors, is recommended as an additional assistance in the formation of a true opinion as to security or otherwise. Failing adequate and reliable guidance from either of these a local inspection is the only safe criterion in the case of water-supplies.

I have been unable to include in this Report as complete and comprehensive a statement as I had hoped to be able to include of the various sources of water-supply in the County. The necessary information is being accumulated though but slowly, and if it should be ready as soon as is expected it will be made the subject of a Special Report to your Committee.

SECTION VII.—Sewerage.

CONGLETON BOROUGH.—Two private streets were sewered during 1910. The following parts are still unprovided with a proper system of sewerage:—Daneinshaw, Castle Inn Bank, Boundary Lane, Lower Park Street, Stonehouse Green, Astbury Marsh, and parts of Sandbach Road and Holmes Chapel Road.

CREWE BOROUGH.—New sewers were laid in 5 streets during the year and a number of back passages have been paved and sewered.

DUKINFIELD BOROUGH.—It is stated that there are no portions of the district now unprovided with a proper system of sewers.

HYDE BOROUGH.—A new sewer 200 yards in length has been constructed in Mottram Old Road, extending from the hospital lodge towards the boundary. There are 20 miles 3 furlongs and 21 yards of public main sewers, and 11 miles 5 furlongs 66 yards of private street sewers in the Borough.

MACCLESFIELD BOROUGH.—Dr. Marsh reports as follows:—

“I am sorry that I am unable to report but little progress in the matter of street sewerage.

“Although it is one of the most essential and primary duties of an Authority to provide its district with sufficient sewers, yet in several areas of this town such has not been done.

“In March, 1909, the Cleansing Committee reported that several streets in East Macclesfield required sewerage. Some four or five only of these streets have received attention.

“The following is a list of streets in East Macclesfield which require attention, and as many of them are in thickly populated areas, the need for sewers is imperative:—

Name of Street.	From	To	Public Street.	Private Street.	If sloughs in.
Beech Lane	Jordangate	Pearl Street	1	...	1
Cawley Street	Brook Street	Joddrell Street	...	1	1
Church Side	Churchwallgate	108 Steps	1	...	1
Eastgate	King Street	Waterloo Street	...	1	1
Goodall Street	Brook Street	Bank Street	...	1	1
Hope Street	Buxton Road	South End	...	1	1
Justice Street	Spring Gardens	Fowler Street	...	1	1
Leigh Street	Brock Street	Bank Street	...	1	1
London Road	South Street	Lyme Street	1	...	1
Millstone Passage	Mill Green	Millstone	...	1	1
Mill Street	Roe Street	Duke Street	1	...	1
Saville Street	Windmill Street	Copper Street	...	1	1
Swettenham St.	Brook Street	Bank Street	...	1	1
Vernon Street	Buxton Road	Longden Street	...	1	1
Waterloo Street	Commercial Rd.	York Street	1	...	1
William Street	Buxton Road	North End	1	...	1
York Street	Waterloo Street	Buxton Road	1	...	1

“In connection with London Road, Mill Street, and Waterloo Street, the matter has progressed as far as the estimates of the cost being approved by the Highway Committee.

“Nothing whatever has been done in respect of the other streets.

“I would especially call the attention of the Town Council to the unsewered state of Daisy Bank and Richmond Hill, which constitute quite a small community. I trust this question may receive greater attention, as it urgently concerns the health of the town.

“It will be noted that the list above given includes East Macclesfield only, and it must be remembered that there are many unsewered streets and parts of streets in West Macclesfield.

“The following streets have been sewered during the year:—

Ryles Park.
Byron Street.
Henderson Street.
Newton Street.”

ALDERLEY EDGE URBAN DISTRICT.—No action of importance is recorded in 1910, and there are no parts of the district without proper sewers.

ALSAGER URBAN DISTRICT.—No new works have been carried out, but it is stated that there are no sewers at Lindley or Sunnyside.

BOLLINGTON URBAN DISTRICT.—Sewers have been extended in Rose Bank, Princess Street and Grimshaw Lane. Certain isolated parts of the district, viz., Long Lane, Windmill Lane and Clarke Lane are not yet sewered.

BOWDON URBAN DISTRICT.—No works have been carried out during the year.

ASHTON-UPON-MERSEY URBAN DISTRICT.—No new works have been executed. The outlying agricultural area, including only a few farms, is not yet sewered.

BOWDON URBAN DISTRICT.—No works have been carried out during the year.

BREDBURY AND ROMILEY URBAN DISTRICT.—It is stated that the district is well sewered and drained to two outfall works. The Sanitary Inspector reports:—

“The Council have for the 2 drainage areas 2 sewage outfall works, 1 at Otterspool for the Romiley district, and 1 at Worth Meadow for the Bredbury district. The system adopted at both works is on the bacteria principle. Samples of the effluents have been taken by the rivers’ inspector, and on every occasion have been certified as good, and always near the top of the monthly list of 60 to 80 samples taken from outfall works belonging to other authorities in the Mersey and Irwell’s Committee’s district.”

BROMBOROUGH URBAN DISTRICT.—No works of sewerage have been carried out during 1910, but a new Company, the Bromborough Port Estate Co., has just started building operations, and a scheme will be necessary for this portion of the area.

BUGLAWTON URBAN DISTRICT.—The whole of the connections to the new sewer leading to the Congleton outfall works have been completed. During the year Queen Street has been sewered. Certain farms treat their sewage on their own land.

CHEADLE AND GATLEY URBAN DISTRICT.—No extensions of the sewerage system have been carried out during the year. The district of Adswood is still insufficiently sewered. An application has recently been made to the Local Government Board in respect of this area.

COMPSTALL URBAN DISTRICT.—The only work which has been carried out here is that the outlets of the sewers have been extended further into the reservoirs. The whole of the urban portion of this district requires a proper system of sewerage and of sewage disposal.

ELLESMERE FORT AND WHITBY URBAN DISTRICT.—The whole of the urban portion of this district is well sewered and the sewers are said to be properly maintained.

HALE URBAN DISTRICT.—The following new work has been done during the year:—(a) A surface water sewer has been laid from Broad Lane to Hawley Lane; (b) A length of surface sewer has been laid along South Downs Road; (c) Sewers have been laid along Cleveland and Hill Top Roads; (d) The sewer in Broad Lane has been extended so as to take the sewage off the property in course of completion at the Hale Road end; (e) Sewage and surface water sewers have been commenced in Seddon Road.

HANDFORTH URBAN DISTRICT.—This district is very imperfectly sewered, and a new scheme has recently been placed before the Local Government Board for their approval.

HAZEL GROVE AND BRAMHALL URBAN DISTRICT.—A new length of sewer has been laid in Offerton Road. A few isolated portions of the district are still without sufficient sewers.

HOOLE URBAN DISTRICT.—No special works have been carried out during 1910. The district of Piper's Ash is still unprovided with sewers, but it is understood that the Council have the question under consideration.

HOLLINGWORTH URBAN DISTRICT.—No specific works were carried out during 1910. There are still a few outlying portions of the districts on the hillsides which are drained into cesspools.

HOYLAKES AND WEST KIRBY URBAN DISTRICT.—In a few outlying portions of the district a number of houses are still unsewered. New sewers have been laid or extended in Ferndale Road, Ridley Grove, Queen's Avenue, Grosvenor Avenue

and Proctor Road. At West Kirby the Lang sewer has been replaced by a new one with a better gradient.

LYMM URBAN DISTRICT.—There have been no alterations or additions of any extent during 1910. A few outlying farms and other houses are still connected with the sewerage system.

MARPLE URBAN DISTRICT.—The report contains the following:—

“The sewers have been periodically examined and appear to be in good order, except a short length on Stockport Road below Cross Lane, which is too small, or to be more correct the gradient is too small. This particular sewer is fifteen-inch diameter, and is laid to a fall of 1 in 800, and its capacity is estimated to be 54,000 gallons per hour, whereas the area drained thereby during a storm, with a rainfall at the rate of $\frac{1}{2}$ -inch per hour, would yield 140,000 gallons per hour. The new connecting sewer in Hibbert Lane has been constructed, and now conveys the sewage from the upper portion of Church Lane into Cross Lane sewer, thereby relieving the sewer in the lower portion of Church Lane, which for several years has been too small. The Cross Lane relief sewer has been constructed from Peacefield cottages, and joins High Lane sewer, and now conveys the sewage from Hibbert Lane, Hawk Green, Church Lane, and Ridge Road. The sewerage system of the district with the one exception in Stockport Road appears to be in good and efficient condition.”

“The present practice is to flush the sewers which have flat gradients only. I would point out that all the dead ends of sewers should be flushed regularly. In many districts not only are the sewers flushed regularly, but the house drains are also flushed, and I recommend this practice as worthy of your consideration.”

MIDDLEWICH URBAN DISTRICT.—Sutton Lane has been sewered during the year.

MOTTRAM-IN-LONGDENDALE URBAN DISTRICT.—A considerable number of trapped gullies are being placed on the sewers in place of open gullies.

RUNCORN URBAN DISTRICT.—About 1,600 yards of new sewers have been constructed during the year. A very small portion of the district in Heath Road is still without an adequate system of sewerage.

WALLASEY URBAN DISTRICT.—A considerable number of defective sewers in streets and passages have been reconstructed or repaired, and a large number of drainage systems in connection with private houses have been entirely or partially reconstructed under the supervision of the health department.

WILMSLOW URBAN DISTRICT.—No special work has been carried out during the year. A few rural parts of the district are stated to be still without sufficient sewers.

WINSFORD URBAN DISTRICT.—It is stated that a small portion of Swanlow Lane needs sewerage, and this is under consideration, but beyond that only a few scattered farms and cottages at some distance from the town are unsewered.

YEARDSLEY-CUM-WHALEY URBAN DISTRICT.—Dr. Welch reports:—

“In September, 1907, a Joint Meeting of the Members of the Yeardsley-cum-Whaley Urban District Council, Chapel-en-le-Frith Rural District Council, and Macclesfield Rural District Council, was held to discuss a Joint Sewerage Scheme. It was decided at this Meeting (1) to invite Messrs. Swan and Brady, Engineers, to draw up a report, (2) to include the Furness Vale portion of Yeardsley-cum-Whaley, and (3) to invite Disley, a neighbouring authority, to participate.

“In December, 1908, another Joint Meeting was held, at which it was decided to petition the Local Government Board for the constitution of a Joint Sewerage district. Disley agreed to join in the scheme. On March 12th, 1909, the Local Government Board held an inquiry in Whaley Bridge, and in June, 1909, sanctioned the formation of a Joint Sewerage district, which comprises the Urban District Council of Yeardsley-cum-Whaley, and the Rural District Councils of Chapel-en-le-Frith, Disley, and Macclesfield. Each district elects a proportionate number of its members to form a Joint Board. This Board met for the first time in January, 1910.

“I am given to understand that the plans for the whole of the work are now completed, and it is probable that the work will be commenced in about six months time.”

At the date of writing this report all the necessary Local Government Board inquiries have been completed and sanctions are expected for the required loans at an early date.

DISLEY RURAL DISTRICT.—No new works have been carried out during 1910. Furness Vale and portions of Newtown still require sewerage, and schemes are under consideration to this end.

MACCLESFIELD RURAL DISTRICT.—The Surveyor remarks:

“One house was newly drained into the sewers at Poynton. 553 houses are now so drained. All the samples of the final effluent which were collected and analysed by the staff of the Mersey and Irwell Joint Committee, were of a satisfactory degree of purity. The samples which were collected and analysed on your own behalf were also all satisfactory.

“The sewers for Prestbury village in the townships of Butley and Prestbury were completed, and about one-half of the houses in the village have already been re-drained to the new sewers. The re-draining of the remainder is now in progress.

“The receipt in May of the Local Government Board’s sanction of the proposal to convey sewage from a portion of Tytherington into the Macclesfield Corporation main outfall sewer enabled the abatement of a series of long-standing and serious nuisances. Of the 26 houses involved all except 3 have been re-drained. Their abominable privies and middens have been cleared away, and water-closets and portable dustbins have been substituted. The delay in connection with the remaining 3 has been due to change of ownership complications.

“The negotiations for land for the purpose of sewers and sewage disposal works at Chelford were provisionally completed, and application is about to be made to the Local Government Board for authority to borrow £1,530 wherewith to give effect to these proposals.”

NANTWICH RURAL DISTRICT.—Dr. Turner remarks:—

“I have no progress to report in the drainage of the large villages, the bad condition of which I have referred to in all my previous annual reports.

“The condition of Haslington, Willaston, Shavington, and parts of Church Coppenhall and Willaston is very bad indeed; as also is that portion of Stapeley known as Broad Lane, and the unsewered portion of the township of Audlem.

I must again specially direct the attention of the Rural District Council to the townships of Haslington and Willaston. With regard to the former of the two, no progress whatever appears to be made in getting out a new scheme, and the nuisances from sewage in the township are innumerable and very grave. From the township of Crewe Green very serious complaints are made of great nuisances from sewage accumulations in the ditches which receive drainage from houses situated in Haslington. These complaints are only too well founded.

“The condition of the township of Willaston is equally as bad as that of Haslington. There appears at length to be some prospect of a scheme being brought to a head for Willaston.

“It is impossible for the Inspector and myself to obtain the abatement of a large number of nuisances in the townships to which I have referred until a proper system of sewerage is undertaken.

“I trust that the Rural District Council will allow nothing to prevent the early attempt to drain effectually these very sewage-soaked villages.”

The Surveyor adds:—

“During the year plans were prepared for the sewerage of Willaston and a portion of Wistaston; the sewage disposal works being situated on land belonging to Mr. J. Bayley, in Colley's Lane, Wistaston. These plans together with estimates were forwarded to the Local Government Board, who asked that part of the cost of same should be apportioned on Wistaston township, and it was eventually decided that a joint scheme for the two townships should be prepared. An offer was received from Capt. Walthall to sell land for a site for the sewage disposal works on the Wistaston Brook, below Wistaston Hall. Surveys were made and levels taken of the site, which was found to be sufficiently low to drain practically the whole of Wistaston and a large portion of Willaston, leaving out, however, the houses near the Peacock Row in the latter township. Satisfactory terms for the purchase of the site were agreed upon with Capt. Walthall, and the plans for this new scheme are now being completed and will shortly be forwarded to the Local Government Board. This is the third scheme that has been prepared for Willaston.

“With regard to the Haslington sewerage scheme negotiations are now proceeding for acquiring land for the disposal works.

NORTHWICH RURAL DISTRICT.—Dr. Gough says:—

“The Sewerage and Sewage works have been dealt with by the Council in all townships where practicable, and a special and constant effort is made to keep this important section of sanitary work up-to-date in every respect. The extension of sewers in Weaverham and Hartford is now engaging the attention of the Council, and the improvement in the outfall works at Gunnersclough and Lostock Gralam are being effectively carried out, and every requirement of the County Medical Officer of Health is proceeded with without undue delay.”

RUNCORN RURAL DISTRICT.—Dr. Adams reports in the following terms:—

“I am not quite aware of the nature of the details which the Local Government Board desires to be presented, in this report, for information, under this heading;—*all* the facts, with Engineers’ details, are in the possession of the Local Government Board, for the several plans of sewerage schemes which your Council has laid down, such as Frodsham and Frodsham Lordship, Helsby, Stockton Heath, Walton, Latchford, Thelwall, &c., and I do not propose to enlarge upon the merits of these schemes, beyond stating that they are effective, and have justified their creation. The area of the Budworth Sub-district, on the highest level above ordnance datum, is able to secure for itself a very efficient series of individual drainage for each separate farm holding and tenancy on the principle of “back to the land.” There is no sewerage scheme on this side of your district until at Stockton Heath and Walton Inferior your Rural district becomes semi-urban, and conjoined sewers and drains finally formulate a sewage scheme for Walton Inferior and Stockton Heath.

“On the level of the River Mersey’s alluvial ‘score’ or ‘flat,’ of Frodsham and Helsby, two sewerage schemes have been planned, one for Frodsham and the other for Helsby. The Frodsham scheme has done fairly well, but I have the idea that sufficient “fall” has not been a prevailing factor in its inception, and that this fact may ultimately necessitate on your Council’s behalf, some reconsideration of your position in reference to your agreements or contracts with

the Manchester Ship Canal, who have interfered with the original level contemplated and legalised in the Act of Parliament sanctioning its construction.

“I do not consider that there is any necessity for your Council to entertain the inception of further sewerage schemes at present, beyond the proposed scheme suggested for the Thelwall and Grappenhall area, which will involve extensive financial outlay, and which I hope will justify its inception. As no details have been submitted to me, I am not in a position to contribute to it anything more valuable than my benediction.

“I am distinctly of the opinion that the difficulties at Moore can be overcome by the exercise of properly and continuously well-directed care and intelligence—but—these faculties must be produced and exercised.”

TARVIN RURAL DISTRICT.—No works of any importance have been carried out during 1910.

WIRRAL RURAL DISTRICT.—Dr. Yeoman reports as under:

“Sewage from the villages of Prenton, Noctorum, Upton, Bidston and Moreton passes through the Fender Valley outfall sewer.

“Sewage from Willaston, Gayton, Childer Thornton, Hooton and part of Eastham is treated in septic tanks and bacteria beds.

“Heswall, part of Eastham, Great Sutton, Little Sutton, Caldby, Poulton, through Lower Bebington sewers, and Grange through Hoylake sewers, discharge sewage directly into tidal waters.

“During 1910 land was acquired for the treatment of sewage and sanction obtained for sewerage the village of Thornton Hough. Short lengths of sewers were also laid at Upton, Childer Thornton, Willaston and Little Sutton. Your Council has had for some time under consideration schemes for sewerage a portion of Willaston village necessitated by the development of a building estate in that township. At Caldby where a building estate is being laid out, it is proposed to construct a sewer and treat the sewage prior to its discharge into tidal water.

SECTION VIII.—Sewage Disposal.

CONGLETON BOROUGH.—During the year 2 sixty feet percolating filters have been completed, and two more are very near completion. Samples of effluent taken recently show a good result.

CREWE BOROUGH.—Considerable progress has been made with the straightening of the Valley Brook as a preliminary to the construction of further bacteria beds. It is understood that the plans for the additional work on the south side of the sewage farm have been revised to meet the recent requirements of the Local Government Board, and that the scheme will be commenced almost immediately.

DUKINFIELD BOROUGH.—Dr. Park reports:—

“The sewage of the district, so far as the sewers themselves are concerned, is very efficiently and extensively carried on, everything being constructed according to a sewage plan, having Bradley Hurst as the outlet. The sewage is conveyed by means of a high level and low level sewer, and is treated by precipitation with chemical filtration, and passes through the land into the river. The plot of land at Bradley Hurst is 63 acres in extent. Over 12,000 tons of sludge are sent over per annum from the sewage. The sewers are ventilated at the manholes, and are regularly flushed, more especially in dry weather.

“House drainage is also carefully attended to, and personal visits are paid to the houses to see as to the proper trapping of drains and condition of slop-stone pipe.

“The condition of the River Tame is, therefore, considerably better as regards pollution, owing to the time and money spent upon the purification of sewage by the various localities on its banks, as no sewage now enters the river from any of these districts.”

HYDE BOROUGH.—The sewage is treated on the bacteriological system with the Caudy-Whittaker automatic filter. There have been no complaints at the outfall works, and no special action has been taken during 1910.

MACCLESFIELD BOROUGH.—Dr. Marsh gives the following particulars:—

“In 1904 and 1905 the sum of £9,849 was spent on the

extension of these works in accordance with the plans and specifications prepared by Mr. R. E. W. Berrington, of Wolverhampton.

"The effluent not proving satisfactory, the Town Council were compelled to set about further improvements and consulted Mr. Berrington particularly as regards the secondary filter and the quantity of sewage dealt with by the new tanks and filters.

"Mr. Berrington stated that at the time of the extensions to the works, the ordinary dry weather flow was stated to his firm to be 600,000 gallons a day, and that the scheme approved by the Local Government Board was sufficient to deal with a dry weather flow of 1,039,000 gallons.

"After various plans had been considered it was decided that the Borough Surveyor and Sewage Works manager should prepare plans for two additional tanks to deal with the storm water.

"They finally recommended the reconstruction of the existing lime race to form a suitable sewage gauge chamber, in which is fixed an overflow weir to take only three times the maximum daily dry weather flow, the remainder being divided by a special plate and diverted into the two new storm water tanks, having a total capacity of 344,082 gallons. The water, after settling in these tanks, will then be drawn off at levels of 3ft. and 7ft. from top water level, regulated by valves and discharged into the existing storm water pipe direct into the river. It is proposed to convey the sludge to previously prepared trenches in the land immediately after the subsidence of the storm. This will necessitate the provision of a new line of sludge pipes, which will also be available for the disposal of a considerable proportion of the ordinary sludge, in addition to that from the storm water tanks.

"The total estimate of the cost of the scheme to be £1,842 6s. 8d.

"This was approved by the Health Committee."

STALYBRIDGE BOROUGH.—Dr. Hancock says:—

"The older portions of the Borough are now well sewered, and extensions are constantly being made into the more outlying portions of the town. The sewage is disposed

of along with that of Dukinfield at outfall works, situated at Bradley Hurst, in the township of Dukinfield. The sewage farm has an area of $63\frac{1}{2}$ acres, and the average dry weather flow of sewage coming to the works from the combined districts is about 2 million gallons per 24 hours. The method of treatment is by screening, chemical precipitation (alumino-ferric and ferrozone being used), sedimentation in large tanks (of which there are 12, in two sets of 6, of 80,000 gallons capacity each) worked upon the continuous flow principle, and then passing the tank effluent on to large sand filters, which unfortunately have almost ceased to act as such owing to the clayey nature of the soil forming the body of these filters, or on to one or other of 3 plots of land for land filtration, but these plots have become more or less sewage choked.

“The sludge in the tanks passes into a sludge-well from which it is ejected into a sludge tower, ready to be conveyed to 2 large presses which convert it into a satisfactory sludge cake which has been found to be of no little value as a manure.

“During the year, 14,288 tons of wet sludge were taken from the tanks and pressed into sludge cake of a weight of 2,448 tons. Of this sludge cake no less than 2,013 loads have been taken by farmers for use as manure. The road dirt or sand taken from the detritus pits amounted to 414 tons.

“In consequence of the choked condition of the sand filters and the saturation of the 3 plots for land filtration the effluent has for some time past been of an unsatisfactory character, so that the Joint Sewerage Board found it necessary to adopt further measures in order to comply with the requirements of the Mersey and Irwell Rivers Board.

“Plans and specifications for the improvement of the works were prepared and submitted to the Local Government Board, receiving sanction on August 11th, 1908. Tenders were shortly afterwards obtained and the contract for the work was let to Messrs. W. Storrs and Sons, of Stalybridge, who commenced the work in April, 1909, but progress with it has unfortunately been somewhat slow.

“The Scheme comprises:—

(1.) The construction of 5 new roughing filters, with an aggregate area of 1,100 square yards, in which

the effluent from the large sedimentation tanks will filter through a bed of coke 2ft. 8in. in depth. This coke, when it has played its part, will be removed and utilised as fuel for the boiler furnaces, its place being taken by fresh supplies of coke.

(2.) The re-laying of the $2\frac{1}{4}$ acres of useless sand filters as percolating beds. These filters have been excavated and drained, and are now being filled with carefully selected graded clinker of a depth of 5 feet. Over these beds the effluent from either the roughing filters or the sedimentation tanks will be distributed by means of Combe's sprinklers attached to iron distributing pipes running transversely across the beds at suitable intervals.

"These new works will shortly be completed and it is anticipated that a thoroughly satisfactory effluent will then be obtained.

"In addition to the foregoing improvements to the works, the method of dealing with the storm water is now receiving attention and application for sanction to construct additional sedimentation tanks and filter beds is now before the Local Government Board.

"In previous annual reports I have referred to the disposal of the sewage from the property situate in the higher portion of Mottram Road and in Matley, where we have a rising residential district, for which the provision for dealing with the sewage therefrom was both unsatisfactory and inadequate.

"Since then several villa residences have been erected in our own district and the sewer has now been extended up Mottram Road in order to pick up the sewage from these and other adjacent properties in the Borough, but no agreement between the Tintwistle Rural District Council and the Stalybridge and Dukinfield Joint Sewerage Board has yet been arrived at with a view to the sewage from the Matley district being turned into our sewer and so being taken to Bradley Hurst for treatment there.

"During the year the Borough of Mossley has completed and opened the extensions to its sewage works at Blackrock within our Borough, and progress is now being made in dealing effectively with the sewage in the outlying districts of Heyrod and Blackrock."

ALDERLEY EDGE URBAN DISTRICT.—The sewage is stated to be treated in tanks, on cinder filters and on land. There have been no complaints during the year.

ALSAGER URBAN DISTRICT.—The sewage is treated by broad irrigation on a rather small area of land. A new sewage disposal scheme is now before the Local Government Board.

ASHTON-UPON-MERSEY URBAN DISTRICT.—The sewage is disposed of in sedimentation tanks and by land filtration. The works have recently been extended.

BOLLINGTON URBAN DISTRICT.—The sewage is disposed of in settling tanks, coarse and fine contact beds and land by filtration.

BOWDON URBAN DISTRICT.—The sewage is disposed of in settling tanks and by subsequent land filtration.

BROMBOROUGH URBAN DISTRICT.—The method of disposal is by septic tanks and contact beds with subsequent discharge into tidal water.

BUGLAWTON URBAN DISTRICT.—The sewage from this district is treated at Congleton Borough outfall works.

CHEADLE AND GATLEY URBAN DISTRICT.—The sewage is treated in septic tanks and subsequently conducted over land.

COMPSTALL URBAN DISTRICT.—The sewage from this small district is conducted into lodges or reservoirs belonging to the Calico Printers' Association without any preliminary treatment. Considerable nuisance arises at times from the effluvia from these reservoirs. A proper method of disposal is urgently required.

ELLESMERE PORT AND WHITBY URBAN DISTRICT.—The method adopted here is by closed septic tanks and subsequent filtration through more or less coarse cinders. The works cannot be said to be well managed.

HALE URBAN DISTRICT.—The disposal is by means of septic tanks, bacteria beds and broad irrigation.

HAZEL GROVE AND BRAMHALL URBAN DISTRICT.—The sewage is said to be treated by chemical and bacteriological methods. One complaint was made by the Mersey and Irwell

Joint Committee in reference to a storm overflow at the Offer-ton Works. New tanks and filters were constructed during 1910.

HOLLINGWORTH URBAN DISTRICT.—The method of disposal is by means of septic tanks, filters and land filtration. All the samples have been reported on as being good.

HOOLE URBAN DISTRICT.—The sewage is collected into the sewers of the Chester Corporation.

HOYLAKE AND WEST KIRBY URBAN DISTRICT.—The sewage is discharged into the river in a crude state at Meols and West Kirby on an ebb tide.

LYMM URBAN DISTRICT.—The sewage is treated on land by intermittent filtration.

MARPLE URBAN DISTRICT.—The reconstruction of the disposal works approved by the Council about 3 years ago is now practically complete, further land being placed under treatment and certain small alterations made to render the storm water treatment more satisfactory having been already carried out.

MIDDLEWICH URBAN DISTRICT.—The method adopted here is by open septic tanks and continuous filtration. The effluent has usually been quite satisfactory.

NANTWICH URBAN DISTRICT.—An entirely new scheme for the disposal of the sewage of this district is stated to be in hand.

NESTON AND PARKGATE URBAN DISTRICT.—The sewage from Great and Little Neston is dealt with by bacteria beds, the effluent being piped into the River Dee. The sewage at Parkgate is discharged into tidal water. The Parkgate sewer is stated to be flushed periodically by means of a private swimming bath discharging 18,000 gallons of water along a six inch pipe into the sewer.

RUNCORN URBAN DISTRICT.—The sewage of this district continues to be discharged into the tidal portion of the Mersey estuary.

SANDBACH URBAN DISTRICT.—Dr. Riddell reports as under:—

“The new sewage system is in very good working order. Minor troubles caused through cinders have been

overcome, and the effluent is now a very good one. The system is as follows:—All the sewers of the town have been connected up with the new sewerage system. One part has a small system of its own, and another that lies very low has been provided with a small pumping station of its own, where the sewage is lifted by a water motor into one of the higher sewers. Storm overflows have been placed at various points. The outfall works are designed to deal with the sewage from 4,600 persons at 20 gallons per head, or 92,000 gallons per day, dry weather flow. The works consist of grit tanks, septic tanks, continuous filter beds, storm beds and 3 acres of land for final treatment. The sewage is delivered at the works in two sewers, which join in an open channel and pass by an open trough 12 feet long, arranged so as to overflow when 6 times the dry weather flow is passing. From here flowing through 2 open channels with weirs 20 feet long, arranged to divide the sewage again, passing 3 times the dry weather flow to the tanks, and the same amount to the storm water bed. There are 2 grit tanks, each 10 feet square by 6 feet deep, with a capacity of 7,500 gallons, and 2 septic tanks, each 41 feet by 20 feet by 9 feet deep, with a capacity of 92,250 gallons. The grit tanks are fitted with chain pumps to remove the sludge, which is pumped to a small lagoon on low ground. There are 2 filters, 70 feet diameter, 6 feet deep, with a total content of 1,710 cubic yards, upon which the sewage is distributed by Fiddian Distributors, and from here the filtrate is distributed to the 3 acres of land by an open carrier. The filters are filled with tap clinkers, broken up to varying gauge, from 2in. at bottom to $\frac{1}{2}$ in. at top. The land has been drained to an average depth of 4 feet. The storm water bed consists of 670 cubic yards of broken clinkers, the water being distributed by half pipe channels.”

TARPORLEY URBAN DISTRICT.—This is by means of land irrigation. During the autumn a small low-lying portion of the land became water logged, and in order to remedy this defect a land drain about 150 yards in length was laid with excellent result.

WILMSLOW URBAN DISTRICT.—The method of treatment is by precipitation and subsequent land filtration.

WINSFORD URBAN DISTRICT.—Dr. Garstang reports on the method of disposal as follows:—

“There is a separate outfall for each side of the river. Each delivers crude sewage on to a large bed of cinders

whose surface is 2 or 3 feet above water level. The bed of cinders itself stands partly on the bank and partly actually in the water. The river here is abnormally wide and deep, owing to the fact that its bed has been included in one of the areas of subsidence caused by brine-pumping. The sewage percolates through the cinders in a manner which makes it impossible to take a sample of effluent for analysis, and leaves a deposit of solid matter on their surface. This is raked or scraped from time to time; and fresh cinders are periodically added, on the surface, as the bed gradually sinks into the river. Occasionally, but not frequently, there are complaints of bad smells. These filter beds lie south-east of the town, well clear of any houses, and have open country to the east and north-east.

"The hamlet of Meadow Bank until quite recently poured its sewage direct into the river. New works are stated to be in progress; but no plans have been submitted to me, nor have I yet made a personal inspection; I am therefore unable at present to say anything about them."

Negotiations have been completed for the purchase of $2\frac{1}{2}$ acres of additional land for improvements.

BUCKLOW RURAL DISTRICT.—Dr. Garstang reports as follows:—

"Drainage and sewerage is generally good and sufficient, where sewers exist. About 100 houses in Dunham Massey have long drained, by agreement, into the Altrincham sewers. 20 houses in Northen Etchells drain into the Cheadle and Gatley sewers. A dozen houses in Tabley Superior and Bexton drain into the Knutsford sewers.

"*Timperley*.—There is a daily flow of some 110,000 gallons at the outfall works at Dark Lane (Dunham Massey), where there are small tanks and cinder filters. The sewage is very dilute and, as the sewer is old, I have little doubt that a large quantity of subsoil water finds an entrance. There were no unfavourable reports from the Mersey and Irwell Joint Committee during 1910.

"*Dunham Massey*.—The normal dry weather flow is estimated at 125,000 gallons at the new works at Woodhouses. Here also the outfall sewer includes a mile of culvert, only one brick in thickness, 3ft. 9in. by 2ft. 3in., and no doubt much subsoil water enters this. There are two open tanks, capacity 120,000 gallons, and 14 acres of

land, 10 of which are laid out for broad irrigation. Sludge from the tanks is dried and carted away. No unfavourable reports during 1910.

“Northenden.”—Dry weather flow estimated at 95,000 gallons. Two tanks, capacity 13,500 gallons. Two cinder filters, 3½ ft. deep, used alternately; 270 square yards area. 4½ acres of land is also used for broad irrigation, and willows are grown. No unfavourable reports during 1910.

“Styal.”—There is a private sewage works at the Cottage Homes. It is generally unsatisfactory. The old village has hitherto drained into the Bollin. A new village is growing up, owing to the new railway and railway station offering new conveniences. A sewerage scheme with outfall works is wanted.

“Rostherne.”—The new property recently erected, and part of the old village, is now being drained by the owner (Lord Egerton of Tatton) by a private scheme.

“Mobberley.”—A very small new outfall (tank and cinder filters) is just approaching completion, to serve Town Lane. Another small scheme for Hall Bank is needed.

“Partington.”—Part of the village drains into a ditch, which communicates with the Ship Canal. The ditch is cleaned out and attended to by the Parish Council; here again proper outfall works would seem to be indicated.

“Peover Superior.”—Here the old problems of Parkgate and Peover Heath remain unsolved, and apparently insoluble.

“Baguley.”—About a dozen houses drain into “Brookes’s sewer.” New houses have been erected in Dunge Lane, and it is not suitable to the particular case to continue to make a separate cesspool for each. A scheme for a joint sewer and disposal works, either by the owners or by the Council, is needed.

“Marthall.”—The David Lewis Homes, with some 300 inhabitants, have a private sewage works, from which the effluent is pumped on to a large natural bed of sand, and is there lost. This is in close proximity to the Pedley Brook.

“Remainder of District.—Other parts of the above townships (10), and the whole of the remaining townships (20), have but a small number of inhabitants, widely scattered; and no question of the provision of public sewers can reasonably arise.”

CHESTER RURAL DISTRICT.—The whole of the sewage is conveyed into the sewers of the City of Chester.

CONGLETON RURAL DISTRICT.—Although no specific complaints appear to have been made it is said that the chemical works at Malkin’s Bank allow some of their effluent to run into the brook above Wheelock, and that on occasion pollution reaches the river from the collieries near Wrinehill.

DISLEY RURAL DISTRICT.—The mode of disposal here is by means of septic tank filters and land treatment.

MACCLESFIELD RURAL DISTRICT.—Disposal is by means of screens, subsidence tanks, septic tanks, percolating filters and land filtration. Some of the sewage of the district is discharged by agreement into the sewers of adjoining districts.

MALPAS RURAL DISTRICT.—The sewage is conveyed to 3 outfalls at each of which open septic tanks and bacteria beds are provided. These need better supervision than has apparently been accorded to them in the past.

RUNCORN RURAL DISTRICT.—Dr. Adams has the following remarks under this heading:—

“I am able to state that such pollution of rivers occurring within your district subsequent to the tour of inspection undertaken by Dr. Vacher, your Inspector of Nuisances, and myself, has been reduced in most cases to a practically irreducible minimum.

“I am aware of several brooks, or water-courses, which are undeniably receiving sewage from various houses, in several townships within your area; but—as your advisory officer, I am not prepared to recommend to your Council that costly schemes of sewerage construction shall be undertaken to remedy defects—frankly admitted—which can otherwise be remedied by persistent and well-directed care. The sewers and open gutters or ditches at Moore, furnish a case in point. If these ditches, channels, or water-courses, receiving sewage from 10 or a dozen houses each had been, from ancient time to now, digged, cleansed, and kept open

and running freely—no Moore sewerage question would ever have arisen. It is not yet too late for your Council to take these open ditches and water-courses in this township into your serious consideration, and, to devise from the existing details, improvements which will satisfactorily deal with existing requirements, and, at the same time, obviate further complaints in reference to individual or isolated cases.

“The massed or mechanically totalled amount of organic pollution of rivers and streams occurring within the area of your District Council, from persons and premises belonging thereto, is a purely trivial matter, when compared with the massed pollution of the River Mersey, with the River Bollin’s contribution, and the greater River Irwell’s contribution from Manchester, and the Manchester Ship Canal’s contribution, with all its legally accepted sewage outfalls, from every district through which it passes.

“I hold distinctly the opinion, in reference to rivers pollution, that your District Council holds a very high rank in its successful efforts to diminish the pollution of natural waters, streams, &c., which arise within or pass through your district’s area, and I am further assured, from my knowledge of the views of your Council, expressed in debate, and in open Council, that your Council resolved to carry out the policy which I have advocated, that is to say (a) control, or suppression of any individual discharge of sewage into any stream, water-course, or other channel passing through your district, and (b) to devise such schemes of sewage disposal as shall eliminate existing defects in your administration, whenever these matters become feasible.

“I would suggest that your Council should, for all your 40 townships still requiring it, lay down arrangements for the effective and regular emptying of privies and cess-pools over the entire area.

“I am quite well aware that your Council has various ornamental owners of horses and carts, designated “contractors” who, at their leisurely convenience in Stockton Heath, and in Weston and Weston Point and in other localities, take the trouble to remove, at their casual convenience, when the privies and ashpits are overflowing on the adjacent areas or back passages, such human excrementitious matter conjoined with ashes, as threaten to become a

nuisance, these conditions accruing from neglect, afford reason for complaint, the complainant comes to me; I have to investigate the complaints; to call in one or two of your Council's Inspectors; and further, to deal with the existing condition and when I have dealt with it and suppressed the nuisance peace reigns until the absolutely identical conditions recur and I execute the absolutely identical official course of action which I have already indicated. I am sure that your Council can bring about an improvement on this question of sewerage disposal, where there is no scheme."

TARVIN RURAL DISTRICT.—There are sewage works at Aldford, Eccleston, Eccleston Ferry, &c., which although originally designed on a most excellent plan, cannot be said to have been as well maintained as should have been the case. Measures, however, are being taken to have these works considerably improved.

SECTION IX.—Milk-supply.

Measures for maintaining the purity of the milk-supply are carried out with varying degrees of vigour and success in the different distticts in the County. Whilst improvements continue to be made in the construction of cowsheds, in the provision of an adequate and pure water-supply, and in the carrying out of methods of cleanliness, a very great deal still remains to be done. Although regulations exist under the Dairies, Cowsheds and Milkshops Order in every district in the County the extent to which their provisions are enforced varies considerably and in many cases only a half-hearted attempt is made to reach a high standard of perfection.

The following few abstracts from the Reports of Medical Officers of Health will give some indication as to the manner in which this branch of public health work is receiving attention.

In the BOROUGH OF CREWE it is stated that many milkshops are quite unsuited for the purpose owing to the want of proper storing room. Despite the fact that a regulation was made on August 1st, 1906, compelling purveyors of milk to properly cover over vessels containing milk for sale, there are still a few who have not yet provided these covers, and many others who do not use them as they ought to be used.

Dr. Marsh (MACCLESFIELD) states that he finds great fault with the very defective ventilation and lighting provided in a large number of shippens, and goes on to say :—

“Cattle, like human beings, readily contract tuberculosis when confined in hot, ill-ventilated, badly-lighted surroundings.

“I trust the Sanitary Authority will look into this matter, as it is of little use spending money on sanatoriums if tuberculosis continues to be spread through the agency of tuberculous milk derived from cows which have contracted the disease because not properly looked after. A cow should be looked on as a living creature, not a mere milking machine, forced by feeding on brewers' grains in a foul, hot atmosphere to produce the greatest possible amount of milk, regardless of the quality of the product or the health of the animal.

“I find fault further with the unsatisfactory way in which the cattle are groomed.

“Seldom, or never is a cow's udder and teats cleansed before milking, and seldomer does the milker put on a clean overall and wash his hands before commencing milking operations.

“To milk cows whose haunches are thick with filth, with unwashed hands and in an old dirty coat is unmitigated nastiness, and deserves the strongest possible censure.”

In BREDBURY AND ROMILEY, the members of the Sanitary Committee visited the principal farms with the Medical Officer and Sanitary Inspector, and suggested certain improvements, which one is pleased to note were readily carried out.

In HOYLAKES AND WEST KIRBY, Dr. Yeoman comments :—

“Much of the milk consumed is imported from the neighbouring rural area. Twenty-seven premises are registered for the sale of milk. Regulations are in force under the Dairies, Cowsheds and Milkshops Order. Your Medical Officer visited each of the premises during the year, and the Inspector reports 89 visits. At the inspections all the utensils were closely scrutinised, and the storage places examined. In every instance it was found that the purveyors were fully aware of the necessity for scrupulous cleanliness, and there was no reason for complaint on this account. Attention had to be drawn in one or two establishments to the need for covers to the receptacles.”

“Cream is sold in some of the shops in specially prepared vessels of paper pulp, which is a great improvement upon the old plan of dispensing this commodity in small tins, which are difficult to cleanse satisfactorily.

“The number of Cowsheds registered is 12. As a general rule these were satisfactory. Nine notices were served requiring limewashing or attention to minor defects. In one case both lighting and ventilation were absent, and were rectified after notice was served. The standard of cleanliness exacted is high, but there is a general disposition among the cowkeepers to comply with the requests of the Council. In some of the outlying and more rural portions of the district, there is still a tendency to keep large manure middens in close proximity to the shippens. The inadvisability of this habit has been pointed out to the farmers.”

In NANTWICH the Inspector remarks :—

“I have made a sanitary survey of the whole of the shippens, which are far from satisfactory, and in some cases the construction of the present buildings do not lend themselves adaptable for any alterations.

“Most of them are badly lighted and ventilated, and are without proper head walks, dung channels and drainage, also have no receptacles for the manure, which is usually deposited on the ground near the buildings.

“During the months of May and October I wrote to all the cow-keepers in the district, requesting them to limewash and cleanse their shippens at the periods set apart in the Council's By-laws, also pointed out to them the advisability of disinfecting and washing the floors, woodwork, mangers, etc., the flushing of drains and cleansing cesspools.”

In NESTON AND PARKGATE Dr. Yeoman says :—

“There are 27 persons registered under the Dairies, Cowsheds and Milkshops Order, but in addition milk is sold by several small shops, where vegetables, food, firewood, etc., are also retailed. Milk-dealers from the neighbouring rural district have a considerable business in Neston, and on the other hand Wallasey and Birkenhead obtain a proportion of their supply from Neston. Within the last year or two there has been a considerable advance in the recognition of the fact that cows require light and air, and the cowsheds are vastly improved.

In one or two instances, structural alterations are still needed in the shippens, but probably the dealers will be induced to attend to these, when they see that it is a matter which will be advantageous to their own interests. Lime-washing has been done regularly, and all the premises are frequently visited by your Inspector. No Veterinary Inspector has been appointed to examine the cows. In one instance I had my attention called to an outbreak of sore throat in a number of persons in a part of the rural district deriving its milk-supply from a Neston dealer. His premises, utensils, and surroundings were carefully examined by me in detail, as well as his employees. Furthermore, I had samples of the milk bacteriologically examined, with negative results. The suggestion that the milk was at fault was mere surmise, and not based on any real evidence."

In the WILMSLOW report, Dr. Byers remarks :—

"There are 30 cowsheds on the register. They were all inspected during the year. In five instances notices were served for defects. No legal proceedings were taken. Regulations are in force under the Dairies, Cowsheds, and Milkshops Order.

"The cowsheds may be said to be satisfactory as regards air space, lighting, and ventilation. Attention has been specially directed to the lime-washing of ceilings and partitions between stalls. In some cases the cows are well groomed; generally there is room for improvement in this respect. The attention of milkers has been called to the advisability of washing the hands and cleaning the cow's udder before milking.

"There is no inspection of cows for tuberculosis. A periodical inspection by a veterinary surgeon would be of great value."

In WINSFORD, Dr. Garstang states :—

"There are no cattle permanently tied up; all are turned out to grass throughout the summer, and also as much as possible in the other seasons. The structure of the cowsheds varies from stone or brick with slate, to the most flimsy erections of second-hand boards and bits of corrugated iron. The capacity varies from 1 to 60 head of cattle. The cubic space per head also varies very widely. So also do all the other important features—lighting, ventilation, condition of floors, drains, disposal of manure, general cleanliness of premises and

cleanliness of individual cattle. The Inspector and myself are constantly endeavouring to teach the importance of these matters to those cowkeepers who are ignorant or indifferent. And though there are still unsatisfactory places, we can at least positively assert that the general condition of the district improves a little each year."

As to the BUCKLOW RURAL DISTRICT, Dr. Garstang continues :

"This is essentially a milk-producing district. No cows are permanently tied up ; all are turned out on grass throughout the summer, and as much as the weather allows in the other seasons. Cowsheds are steadily being improved, and the average cleanliness of the cattle is better. There are, however, still to be found cattle so kept that at a mid-day inspection each animal will be found with hindquarters and tail (and sometimes udder and teats) caked with dung ; and where this is due to causes other than the structure of the shed, I have not yet found Act or Section which directly deals with it."

In the NANTWICH RURAL DISTRICT the Inspector reports :—

"The number of cowkeepers and milksellers on the register continues to increase. At the end of 1909 there were 236 on the register. The number at present is 256. During the year 656 visits were paid to registered and unregistered dairies, &c. I found on inspecting the registered cowsheds that the walls had been limewashed in accordance with the regulations. In some instances the cowkeepers limewash the walls of their cowsheds frequently during the year with a patent limewashing machine. I was told by some cowkeepers that the glazed feeding troughs in their cowsheds are periodically washed out with water containing a solution of disinfectant. This is a practice which cannot be too highly commended. On several dairy farms steam boilers are kept in the yards provided with steam nozzles for thoroughly scalding the milk vessels after washing, so as to ensure thorough cleanliness. Great care is exercised by many of the farmers who send their milk to cities and towns, with a view of producing it as pure and as free as possible from contamination.

"During the course of my inspections in the district I discovered that several unregistered cowkeepers were sending their milk to factories, and on enquiry in one instance I was told by the cowkeeper that he was sending his milk to the city of Manchester. I verbally cautioned each unregistered

milkseller and requested him to make an application to be placed on the register, and I also reported them to the Sanitary Committee. On the Committee's recommendation to the Council the Clerk was instructed to again have bills posted throughout the district stating that all dairymen and milksellers must be registered in accordance with the Dairies, Cowsheds, and Milkshops Order. Several persons, since the issuing of the posters, have applied for registration. The applicants' cowsheds, &c., were inspected, and their sanitary condition noted and reported on. In ten cases it was found that improvements were required in the lighting, ventilating, paving, and draining, and with one exception the suggested improvements were carried out. A copy of the regulations is sent to each newly registered person. During the year thirteen cowsheds and four dairies, &c., have been erected. In all the dairies the floors were constructed with concrete floated with cement or some other impervious material, and in one case the internal walls of the dairy were faced (for a distance of about five feet from the floor) with glazed bricks and the upper parts faced with non-porous bricks."

IN NORTHWICH RURAL DISTRICT Dr. Gough says:—

"There are 383 farms registered for the sale of milk, and it is said they are rather over-attended to than otherwise, but it should be pointed out that the regulations under the Dairies Order are rapidly becoming the farmer's rule of life in dealing with his cattle and supply of milk, together with the limewashing and cleanliness of his shippens. There is, however, an insurmountable difficulty, viz.: the regulations make the person registered to sell milk responsible for structural works at his shippens."

RUNCORN RURAL DISTRICT.—Dr. Adams says:—

"In your district there are about 200 persons registered for the sale of milk, of which the large majority control "cowsheds" under the "Dairies," &c., Act of 1885, and from which milk is forwarded to industrial centres. In almost all these cases the milk is dealt with entirely outside the dwelling-houses, and, as far as is practicable, by persons who do not reside on the premises. In the event of infectious diseases occurring on the premises, the further sale of milk is (1) either prohibited, during the presence of disease on the premises, or (2) is dealt with in accordance with local regulations made by your Council, under the Dairies, Cowsheds and Milkshops Act of 1885. These regulations are strictly enforced within your district.

"In reference to the sale of milk to outside communities your district has occasionally been invaded by officials from other Corporate bodies, mainly in reference to tuberculosis, in milk, or in milking stock. These invasions have generally been made without a strict compliance with the regulations dealing with such powers of inspection on the part of any Corporate body to invade and inspect the area or farm stock of another Corporate body, without the necessary order having been obtained of or from a Justice of the Peace, resident in any portion of the district proposed to be so inspected. I feel quite sure that this point may have been overlooked, and that, on proper representation being made, a stricter compliance may easily be attained, and, thereby, a considerable amount of totally unnecessary friction might thus be easily eliminated. I would suggest that such further enquiries should be carried out, *only* after due notification of the purpose of such inspection having been made, either to, (a) the District Medical Officer of Health, or (b) the Inspector under the Dairies and Cowsheds Act of 1885.

"If these official courtesies were observed, I am quite sure that, in the majority of cases, the Justices' Order could be dispensed with.

"I desire to observe that a large proportion of farmers and milk sellers within your district are fairly well acquainted with the nature of tuberculosis as affecting their occupation as milk sellers, and also as affecting the health of the community; and, from my personal knowledge of a large number of them, I am convinced that they will join in any broadly conceived scheme for the stamping out of tuberculosis, alike in cattle and in man; but,—they wait for an indication that the State will recognise their sympathetic attitude, and that, after due consideration, the State will deal with the tuberculous milking cow, as they formerly dealt with "pleuro-pneumonia," that is to say, on a basis of proportional, or total, compensation;—or some other State-devised scheme of insurance against tuberculosis."

WIRRAL RURAL DISTRICT.—Dr. Yeoman states:—

"There are 267 licensed cowsheds and milk-sellers in your district. Not only are the neighbouring urban districts supplied, but also the towns of Birkenhead, Wallasey and Liverpool. The cowsheds are regularly inspected and frequent lime washings insisted upon wherever they are required. The

shippens vary from the model dwellings of wealthy persons who make farming a hobby, down to primitive sheds where both ventilation and lighting are deficient. During the last ten years there has been a considerable advance in the provision of light and air for the animals, as there is a general recognition of the fact that cows are more profitable when well housed. The arguments used against further improvement in this direction are generally (1) that it is the occupier who is called upon to do the improvement, and not the owner, which is unfair, (2) that better housing is not required, as the cows are in the open air most of the time. At some of the farms the milking arrangements are of a model kind. No inspector with veterinary knowledge has been appointed to examine cows."

SECTION XI.—Miscellaneous.

Abatement of Nuisances.—This is a comprehensive term under which almost all minor sanitary defects in relation to the dwelling and its surroundings are included. The records contained in the Annual Reports of work done in the remedy or abatement of nuisances are in general excellent. Resort to legal proceedings appears to have only been necessary in very few cases.

Common Lodging-houses.—In the Borough of Congleton there are 4 houses of this class accommodating 84 lodgers in all: they have been used during the year by 21,725 lodgers and were inspected weekly. In this Borough they are under the supervision of the police and are said to be well conducted and in satisfactory sanitary condition.

There are now 9 common lodging-houses in the Borough of Crewe. For the most part, it is stated, their structural condition is defective and thus the sanitary standard attainable is not of the highest.

There are no common lodging-houses in the Borough of Dukinfield. In the Borough of Hyde there are 3, accommodating in all 85 lodgers, and the remarks made with reference to those in Crewe appear to be applicable to the Hyde lodging-houses. Similar criticism may be also passed on the common lodging-houses in the Borough of Macclesfield, where there are 9 lodging-houses in which 44,775 nightly lodgers

were accommodated during the year. In Stalybridge Borough there are 2 common lodging-houses, and certain premises attached to one of these were closed during 1910 as unsuitable for their purpose.

Two common lodging-houses in Middlewich Urban District were found to be structurally dangerous and were demolished. In Northwich Urban District, where there are 6 houses of this class, two cases of overcrowding were reported and 1 person was prosecuted for keeping an unregistered house.

Refuse Removal and Disposal.—The reports on this important question are in general quite satisfactory. But in many districts systematic removal is not attempted and local farmers are left to do it at their own time. A little organisation on the part of any active Sanitary Inspector would easily remedy this sanitary default.

The special peat-pail system apparently continues to act very well in its home—Congleton Municipal Borough and the example has spread to one or two other districts. Dr. Garstang reports on it as carried out in the KNUTSFORD URBAN DISTRICT as follows:—

“Many years ago, in fact very soon after I entered upon my duties, I was impressed with the superiority of the “Congleton peat-pail” to the common privy or to any other form of pail; and I got them introduced in four Urban Districts. They have from time to time been the subject of complaint, but on investigation the cause has invariably been found to be improper use, either by householder or by scavenger; and, if properly used, I still retain my belief in them as the least offensive provision for cottages which have not water-closets. It will be remembered that the essential points are (1) the provision of peat dust, (2) the acidulation of the peat dust by the addition of one-tenth its weight of crude sulphuric acid, and (3) the placing of a three-inch layer of acidulated peat in the bottom of each fifteen-inch pail.”

In ALTRINCHAM URBAN DISTRICT it is reported that the arrangements for the removal of night-soil “have been greatly improved and systematised.”

Dr. Yeoman, speaking of the NESTON AND PARKGATE URBAN DISTRICT, reports that:—

“Excreta are disposed of, partly by water carriage and partly by ashpit privies, which are emptied by men in your employment. Nine of the privies were converted into

water-closets during the year. I would urge upon you the necessity of the removal of privies and the provision of water-closets wherever the houses are within reach of the sewers, as in this respect your district compares unfavourably with other Urban Districts in Wirral. The abolition of large wet ashpits should also be insisted upon. During last year an important step in the right direction has been taken by you, when you ceased to let the removal of refuse any longer by contract, and purchased your own horses and carts to deal with this matter. The old system had proved unsatisfactory and the new bids fair to be a success. The provision of galvanized iron dust bins, which are emptied at short intervals, is a practice increasing in your district and is to be commended. In 1910, 2,986 tons of refuse were removed to tips on agricultural land."

A destructor is recommended for the NORTHWICH URBAN DISTRICT by the Sanitary Inspector.

IN HALE URBAN DISTRICT a somewhat novel system is in force and is thus described by the Medical Officer of Health:—

"The method in vogue aims at the removal of refuse without soil pollution, as follows:—A low built lurry laden with air-tight bins is drawn to the various parts of the district. To the rear of the lurry a rubber-tyred trolley is attached. Having arrived at the destination, a bin is placed on the trolley, and this is drawn and placed against or near the receptacle to be emptied, and the contents of the latter are emptied direct into the bin. When full the bins are taken to a tip and emptied there. This method is employed in all privies, pail closets, and ashpits, and has proved very satisfactory indeed, and inexpensive.

"Owners and occupiers are being encouraged to replace ashpits by bins, and during the year 27 dry ashpits have been abolished and bins substituted. Ashbins are emptied direct into a covered cart.

"The air-tight bins used for the removal of the refuse are, from time to time, washed out with disinfecting solution, and at other times are dusted with carbolic acid powder, each being done according to requirements."

The privy-midden is far too much in evidence at RUN-CORN, but it is reported that:—

"The old privy and ashpit system is being got rid of as speedily as circumstances will admit, for although the work of the conversion of the privy pits into water-closets

is only making slow progress, it is at all events making sure progress. Twenty-seven privy-pits were converted into water-closets during the year. Privies and ashpits are subject to frequent emptyings. There is no storage of feculent matter allowed now at people's back doors, and it cannot be urged too much that accumulations of this kind should not be so. Household-ers can help in this matter very much by giving timely notice for the removal of night-soil. Barging up the canal has been for some time the most common method of disposal."

It may be remarked that it should not be necessary in any well-arranged scheme for household-ers to give notice for the removal of night-soil.

IN WINSFORD URBAN DISTRICT Dr. Garstang reports that it is estimated there are now:—

"1,331 privies, 659 water-closets, and 419 peat-pails. When I became Medical Officer of Health in 1896, there were very few water-closets and no peat-pails. The Sanitary Authority, before that date, had encouraged privies and discouraged water-closets, under a fear that the use of the latter would increase the difficulty of sewage disposal. The old privies are of peculiar construction (there are similar ones at Middlewich). The receptacle is sunk in the ground, and is not confined to the area under the seat, but is prolonged under or through the side wall into the back yard. This part is covered with a stone or with timber (its object is to afford means of access for the scavenger). Frequently it receives rain water from the privy roof, or even from the yard surface, so an untrapped overflow pipe is laid connecting it with the nearest sewer. These receptacles are locally called "cesspools," but this is a specialised use of that word. The peat-pail system was introduced by myself; and gradually the Authority has come to permit water-closets, and to encourage the conversion of the old privies into either water-closets or peat-pails, and the numbers quoted above are evidence of Mr. Hickson's activity. No other kind of pail is allowed."

The arrangements for the removal of house refuse, and the cleansing of earth-closets, privies, ashpits, and cesspools in this district are not entirely satisfactory.

"Briefly put, the arrangements are divided between contractors, who empty the privy-cesspools, and the Council's own staff, who attend to peat-pails and ashpits. There

is only one unsatisfactory feature; the contents of ashpits are frequently wheeled from the back yards and tipped in the street early in the day, and sometimes lie there (a dangerous nuisance, especially to school children), until late the same day before being carted away. This work ought, as far as possible, to be done in the night time."

Dr. Adams (RUNCORN RURAL DISTRICT) is of opinion that the Council could ensure better results in the matter of refuse removal. He says:—

"I think you should reconsider your arrangements with your local "contractors," at any rate in such localities as I myself have, on my official inspections, or visits, ascertained that your "contractors" had left privies, cesspools, &c., to fill, and spill over healthy and clean ground (back passages, but still clean ground), just to suit your contractors' convenience. This is not sanitation, also, it is not what your Council desires. I can cite numerous instances in your district, but I prefer to leave the matter at this point, and to suggest that your contractors for the removal of house refuse, and the cleansing of earth-closets, privies, ashpits, and cesspools within the district, should have their attention directed to my remarks, and to my observation, that, in whatever part of your district, arrangements are made with contractors for removal of excreta, &c., the removal of such excreta is not always satisfactorily carried out.

"To complete my observations under this paragraph I should like to point out that the adoption of public water-supplies (as already set forth in a previous section of my report), has revolutionised the sanitary arrangements of your district, so far, at least, as this fact can affect facilities for sewage disposal. The adoption of the various water-supplies (5 in number) already described, has enabled all townships served by such water-supplies to adopt, where possible, the water-carriage system of sewage disposal; and in such cases wherein it has not yet been adopted, its possibilities still remain, subject to ordnance datum, or other mechanical inconveniences."

Meat Inspection.—In the BOROUGH OF CONGLETON the service of a Veterinary Surgeon are available for meat and slaughter-house inspection. He reports that:—

"There are 13 licensed slaughter-houses, 11 of which are in constant use; 13 rounds of inspection were made, and generally the slaughter-houses were found in a fairly

clean condition, some being excellently managed, but there were one or two that did not have the garbage removed so immediately as the regulations require; that, in addition to those visits, he received requests on 8 occasions from the butchers to inspect doubtful carcasses, and two whole carcasses and portions of four others were condemned as unfit for human food on account of being tuberculous; that, approximately, 900 cattle, 3,900 sheep and 2,350 pigs were slaughtered in the slaughter-houses, and, as a rule, the quality of the meat was of high class; that the frozen meat shops were frequently inspected without anything of an unusual nature being found, and that the supplies seemed to have been carefully regulated and the meat sold while in good condition. He also made frequent visits to the fish stalls in the market place on Saturday night, as well as to the fish shops in the town, and found them in a satisfactory state."

IN ALSAGER URBAN DISTRICT it is reported that:—

"The Council has insisted on the storage of offal from slaughter-houses in properly constructed iron bins having well fitting covers. This has to a certain extent diminished the swarms of flies which infest offal heaps, or manure heaps, when offal is carelessly deposited on them."

BOLLINGTON URBAN DISTRICT.—The Medical Officer of Health states that:—

"Inspection of slaughter-houses and meatshops resulted in the seizure and destroyal of a portion of meat weighing 112lb., such meat being affected with tuberculosis. Proceedings were taken against the owner and also the salesman. Fines of £10 and costs on the former and £2 and costs on the latter being imposed.

"In this case the meat had been slaughtered in a slaughter-house out in the Rural District practically out of the way of inspection, and as diseased meat is much more easy of detection when in process of slaughtering, the existence of such slaughter-houses are a source of danger in the supply of diseased meat to the public.

"It would be an advantage if such places could be abolished, or powers provided whereby the authority in whose district meat is exposed for sale, could inspect it in course of preparation.

“In another case a whole carcase weighing 640lbs. was destroyed, the disease being detected immediately the beast was opened. This occurred in a local slaughter-house and the owner offered every facility and assistance in its removal and destroyal. As this was a case of genuine misfortune, costing the owner £17, it might ensure help and co-operation in preventing the sale of diseased meat if there was some means of compensation provided in such cases; and, of course, in this case, there was no prosecution.”

In NANTWICH URBAN DISTRICT the Inspector states that he has paid 456 visits during the year to the 11 licensed slaughter-houses—an excellent record.

In WALLASEY URBAN DISTRICT a whole-time Meat Inspector is employed and appears to do excellent work.

In NANTWICH RURAL DISTRICT Dr. Turner reports that:—

“He has personally inspected seven carcases of beef, and have caused four whole carcases, two fore-quarters, and one leg to be destroyed, the cause for destruction in all but the last being tuberculosis.

“On September 19th, 1910, I seized at 1-45 a.m. a much emaciated tuberculous carcase in a slaughter-house at Shavington, my information having been received at 1 a.m. by telephone from the police at Crewe. I showed it to a Justice of the Peace the same day, and after obtaining his order I had the carcase destroyed. I reported the matter to the District Council at the next meeting, but they decided not to take action against the owner, as they did not consider that the carcase was intended for food. The police then decided to lay an information. The owner was summoned and was fined the maximum penalty of £20 and costs. He has appealed on the ground that the police had no right to lay an information against him.”

On appeal it was decided that the conviction must be quashed on the grounds that the prosecution having been undertaken by the Superintendent of Police, who was not an “aggrieved person,” the consent of the Attorney-General was necessary and it had not been obtained in this case.

Factory and Workshops Act, 1901.—Under this Act it is the duty of every Medical Officer of Health to report specifically every year on the action taken, and the Chief Inspector of Factories, Dr. B. A. Whitelegge, has for some time issued

a form indicating the headings under which information is desired. This form is appended to all the Annual Reports received, and a perusal of the contents shows that for the most part the details of the Act have received attention at the hands of Local Sanitary Authorities in the Administrative County. There is nothing at present calling for special mention in this connection.

Canal Boats Acts.—These Acts are only enforced in those districts where there is a recognised “stopping-place” for canal boats. As they are for purposes of inspection “floating houses,” and as the regulations of the Local Government Board concerning them do not err on the side of strictness, it is desirable that inspection should be thorough, and the enforcement of necessary remedies prompt and effective. The more important sanitary matters requiring supervision are cleanliness, ventilation, overcrowding, water-supply, provision of double bulk-beds where offensive cargo is carried, the regular removal of bilge-water, and the control of infectious disease. The provisions of the Acts and Regulations appear to have been systematically and properly carried out.

Public Health Acts Amendment Act, 1907.—The following Local Authorities have adopted the above Act in part:—

Crewe M.B.
 Stalybridge M.B.
 Wallasey M.B.
 Alsager U.D. (Part III., ss., 39-42)
 Ashton-upon-Mersey U.D. (Part I. to VI.)
 Lower Bebington U.D.
 Bollington U.D.
 Bowdon U.D.
 Bredbury and Romiley U.D.
 Bromborough U.D. (Part III.)
 Cheadle and Gatley U.D. (application made.)
 Ellesmere Port and Whitby U.D. (Parts II., III., IV. and VI.)
 Hale U.D.
 Hoylake and West Kirby U.D.
 Marple U.D.
 Neston and Parkgate U.D.
 Runcorn U.D.
 Bucklow R.D.
 Nantwich R.D.
 Northwich R.D.
 Runcorn R.D.

General Remarks on the Annual Reports.

The information to be given in Annual Reports of Medical Officers of Health is specified in the Order of the Local Government Board dated December 13th, 1910. Some Medical Officers of Health have faithfully carried out this duty and have not only furnished the necessary information, but have presented it in the order of the headings in the Local Government Board Regulations. In a good many cases, however, this Order does not appear to have come to the knowledge of the Medical Officers of Health, or at all events not to have been interpreted as an *Order*. The wording of the Order is plain enough—the Annual Report *shall* contain the information specified:—

“In addition to any other matters upon which he may consider it desirable to report, his Annual Report shall contain the information indicated in the following paragraphs; together with such further information as we may from time to time require:—

(a) An account of any influences threatening the health of the district, the prevalence of infectious or epidemic diseases therein, and the measures taken for their prevention.

(b) An account of all general and special inquiries made during the year.

(c) An account of the work performed by the Inspector of Nuisances during the year, including the statement supplied in pursuance of Article XX. (16) of this Order.

(d) A statement as to the conditions affecting the wholesomeness of the milk produced or sold in the district.

(e) A statement as to the conditions affecting the wholesomeness of foods for human consumption, other than milk, produced or sold in the district.

(f) A statement as to the sufficiency and quality of the water-supply of the district and of its several parts, and in areas where the supply is from waterworks, information as to whether the supply is constant or intermittent.

(g) A statement as to the pollution of rivers or streams in the district.

(h) A statement as to the character and sufficiency of the arrangements for the drainage, sewerage and sewage disposal in all parts of the district.

(i) A statement as to the privy, water-closet, and other closet accommodation in the district, including information as to the approximate number of each type of privy and closet.

(j) A statement as to the character and efficiency of the arrangements for the removal of house-refuse, and the cleansing of earth-closets, privies, ashpits, and cesspools in the district.

(k) A statement with regard to the housing accommodation of the district as required by Article V. of the Housing (Inspection of District) Regulations, 1910, and an account of any other action taken by the Council under the Housing, Town Planning, &c. Act, 1909, bearing on the public health.

(l) A statement as to the vital statistics of the district, including a tabular statement, in such form as we may from time to time direct, of the sickness and mortality within the district.

(m) Where the Medical Officer of Health is appointed by the Council of a County Borough, or by a Council having delegated powers under the Midwives Act, 1902, a statement as to the administration of that Act in the district."

Some of the Reports furnished only very scanty information and one or two were a mere collection of figures without any attached comments. Skeleton reports of this character are very unsatisfactory and an appeal is therefore made to the Medical Officers of Health concerned to clothe their records with some remarks on the circumstances attending the cases to which the figures refer.

The arrangement of the matter in some of the Reports leaves much to be desired: things which might well be all placed under one specific heading are not infrequently alluded to in several scattered paragraphs. The alteration of this small matter should present no difficulty.

About a dozen of the Reports were presented in manuscript or type-written form. In order that the Councils

concerned may have the advantage of a quiet and considered perusal of such Reports, it is very desirable that they should be printed. It is most pleasing to note that a few which previously had been presented in manuscript form are now printed.

In order to effect a reduction in the size of this volume the more or less formal preparation of abstracts of each individual Report has been abandoned, and an endeavour has been made to extract from the Reports matters of special interest and to present these in sequence under various headings. The result is that all the really essential information is put before your Committee, and this in a volume approximately half the size of its predecessors. It is hoped that this arrangement will commend itself to your Committee.

MEREDITH YOUNG, M.D., D.P.H.,
County Medical Officer of Health.

Administrative County of Chester.

APPENDIX OF STATISTICS

FOR 1910.

TABLE I.—Population, Area, Births, Deaths, &c.—

Showing enumerated and estimated population, area, persons per acre, births and deaths, birth-rates, and death-rates, proportion of deaths of infants to births, deaths from seven principal zymotic diseases, and corresponding death-rates.

TABLE II.—Mortality—

Showing deaths from certain causes, classified according to Diseases, Ages, and Localities.

TABLE III.—Infectious Disease—

Showing new cases notified and new cases removed to Hospital classified according to Diseases and Localities, and giving particulars as to Isolation Hospital provision.

NOTE.—The information in these Tables is derived from the returns made by the District Medical Officers of Health on Forms supplied to them by the Local Government Board. The proportion of persons per acre, the deaths from the seven principal zymotic diseases, and corresponding death rates have been added. The population in 1901, and the areas, are from the full Report of the Census of the County of Chester, the summary to which is dated August 10th, 1902.

TABLE I. STATEMENT

prepared from the Reports of Medical Officers of Health of Sanitary Districts in the Administrative County of Chester,
for the year ending 31st December, 1910.

SANITARY DISTRICTS	Population at Census, 1901.	Estimated Population in middle of 1910.	Area in Acres.	Persons to an Acre.	Births.	Birth-rate per 1000 Living.	Deaths.	Death-rate per 1000 Living.	Deaths from							Deaths from Principal Zymotic Diseases.	Principal Zymotic Diseases Death-rate.	Deaths under one year.	Deaths under one Year to 1000 Births.	Is Hospital Isolation for Infectious Diseases provided?	Name of Medical Officer of Health.
Column Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
MUNICIPAL BOROUGH.																					
Congleton ...	10707	10706	2572	4.16	305	23.4	165	15.4			1	2	1	2	3	9	.84	36	118	Yes. West Heath Joint.	Dr. P. M. Davidson.
Crewe ...	42074	42340	2185	22.62	1112	23.0	572	11.8		16	3	32	6	5	8	70	1.44	115	103	Yes. Crewe.	Dr. G. G. Buckley.
Dukinfield ...	18929	20500	1405	14.59	478	23.09	312	14.5		3	4	3	11	8	4	33	1.6	78	163	Yes. Hyde.	Dr. J. R. S. Park.
Hyde ...	32766	34883	3081	11.3	723	20.75	510	14.64		18	4	7	4	4	3	40	1.15	102	141	Yes. Hyde.	Dr. J. Bennett.
Macclesfield ...	34624	34624	3214	10.77	686	19.8	492	14.2		4	5	3	3	2	2	19	0.5	71	103	Yes. Macclesfield.	Dr. J. H. Marsh.
Stalybridge ...	27673	29201	3130	9.30	618	21.16	457	15.65			9	1	11	3	5	29	1.0	103	166	Small-pox only, Joint Board's, Hartshead.	Dr. W. J. Hancock
	166773	178253	15587	11.30	3922	22.0	2508	14.06		41	26	45	39	24	25	200	1.12	505	128		
OTHER URBAN DISTRICTS.																					
Alderley Edge ...	2856	3178	599	5.27	52	16.3	24	7.5							1	1	.31	4	76	Yes. Bucklow Joint and Baguley.	Dr. G. W. Dowling.
Alsager ...	2597	2584	2241	1.28	53	20.11	27	9.36					1			1	.33	6	103	Yes. West Heath Joint	Dr. H. F. Kingston.
Altrincham ...	16831	18840	662	28.45	405	21.4	227	12.2		8		2	7		2	19	1.0	42	103	Yes. Altrincham.	Dr. A. Golland.
Ashton-upon-Mersey ...	5563	6500	1622	4.1	166	25.5	68	10.4			1		2		2	9	1.3	10	60	Yes. Baguley.	Dr. C. J. Renshaw.
Higher Bebington ...	1540	1648	699	2.35	39	23.6	21	12.7								0		1	25	Yes. Wirral Joint.	Dr. J. B. Yeoman
Lower Bebington ...	8398	12226	1051	11.68	316	25.9	125	10.2	1		1		4		4	10	.8	29	91	Yes. Ditto.	Dr. Geo. Hill
Bollington ...	5245	5245	1291	4.06	100	19.06	56	10.6								0		4	40	Yes. Macclesfield.	Dr. D. W. Main
Bowdon ...	2788	2580	850	3.38	25	8.6	31	10.7								0		2	62	Yes. Baguley.	Dr. M. Duggan.
Bredbury and Romiley ...	7185	9235	398.6	2.31	197	21.1	113	12.2				1	3		1	5	.54	17	86	Yes. Hyde.	Dr. F. Cant.
Bromborough ...	1891	2110	1678	1.25	50	23.7	14	6.6						2		2	.95	3	61	Yes. Wirral Jt. and Pool Works Village	Dr. W. R. J. Garson.
Buglawton ...	1452	1452	2911	0.49	36	24.7	21	16.5								0		2	55	Yes. West Heath Joint.	Dr. P. M. Davidson.
Cheadle and Gatley ...	7916	10462	5086	2.05	176	18.5	89	9.36					1			1	.1	9	51	Yes. Baguley.	Dr. J. H. Godson.
Compstall ...	875	890	903	.98	14	15.7	14	15.7								0		4	285	Yes. Hyde.	Dr. C. H. Hibbert.
Ellesmere Port & Whitby ...	4082	8771	1261	6.95	378	42.4	99	11.2				1	1			2	.22	30	84	Yes. Wirral Joint.	Dr. J. B. Yeoman.
Hale ...	4562	8930	1288	7.0	162	18.14	62	6.9	1				1	1	2	5	.56	10	61	Yes. Baguley and Monsall.	Dr. T. A. Lothwell.
Handforth ...	911	949	1312	.72	27	28.45	6	6.3								0		0	0	No.	Dr. A. Nowell.
Hazel Grove and Bramhal ...	7934	10886	5488	1.98	193	17.6	100	9.18			1	3	3			7	.64	9	46	Yes. Hyde.	Dr. Thos. Moore.
Hollingsworth ...	2447	2980	2086	1.42	72	24.1	40	13.4							1	1	.33	7	97	Small-pox only, Mottram Moor.	Dr. H. W. Pomfret.
Hoole ...	5341	6321	334	18.9	137	23.5	64	10.9	2	1					1	4	.63	15	109	Yes. Chester.	Dr. F. J. Butt.
Hoylake and West Kirby ...	10911	14840	2066	7.18	253	17.1	153	10.3						2	3	5	.33	19	75	Yes. Wirral Joint.	Dr. J. B. Yeoman.
Knutsford ...	5172	5689	1760	3.23	111	19.5	60	10.5						4		4	.7	10	90	Yes. Baguley.	Dr. T. W. H. Garstang
Lymm ...	4707	5000	4372	1.14	107	21.4	58	11.6				3	3		1	7	1.4	10	93	Yes. Ditto.	Dr. E. M. de Jong.
Marple ...	5595	5500	3054	1.89	124	21.3	72	12.4			1		2	2		5	.86	5	40	Yes. Hyde.	Dr. H. Burton.
Middlewich ...	4669	4998	1082	4.61	134	26.7	50	10.1	1		1					2	.4	6	44	Yes. Davenham and Marbury.	Dr. S. L. Melville.
Mottram ...	3128	3200	1084	2.95	52	16.2	32	10.1								0		4	76	Yes. Mottram Moor.	Dr. G. J. Awburn.
Nantwich ...	7722	7992	703	11.86	166	23.3	109	13.9	1		3	2		2		8	1.1	28	150	Yes. Alvaiston Joint.	Dr. J. D. Munro.
Neston and Parkgate ...	4154	4676	3267	1.43	136	29.08	47	10.1	1	1	1			2		5	1.06	6	44	Yes. Wirral Joint.	Dr. J. B. Yeoman.
Northwich ...	17611	20260	1397	14.5	478	23.1	263	12.9	2		7	1		6		16	0.83	54	112	Yes. Leftwich.	Dr. H. E. Gough.
Runcorn ...	16491	18000	1275	14.1	515	28.6	251	13.9	1	3	6	12	5	3		30	1.66	72	139	Yes. Runcorn.	Dr. F. McDougall.
Sale ...	12088	16200	2006	8.07	370	22.8	171	10.5			2	4	8	1	7	22	1.3	32	86	Yes. Baguley and Monsall.	Dr. O. Wither.
Sandbach ...	5558	5556	2694	2.65	141	25.4	60	10.7								0		8	56	Yes. West Heath Jt. Arcid for Smallpox.	Dr. R. Riddell.
Tarpotley ...	2644	2594	6195	.41	62	23.9	44	16.9					1			1	.38	7	113	Yes. Chester.	* Dr. C. M. Hewer.
*Wallasey ...	53579	75000	3319	22.39	1724	22.9	888	11.8	15	3	4	19	5	15		61	0.9	149	86	Yes.	Dr. T. W. Naylor Barlow.
Wilmslow ...	7361	8300	5090	1.63	171	20.6	83	10.1	1							1	0.12	4	23	Yes. Baguley and Monsall.	Dr. A. Byers.
Winsford ...	10382	10732	5780	1.85	287	26.7	133	12.4			1	1	1		6	9	1.6	24	84	Yes. Davenham and Marbury.	Dr. T. W. H. Garstang.
Yeardsley-cum-Whaley ...	1487	1639	1823	1.23	27	16.4	12	7.3								0		1	37	Yes. Hyde and Hyde Peak.	Dr. T. A. Welch
	263673	326363	81845	8.99	7476	22.90	3690	11.28	1	33	15	41	72	22	59	243	.74	643	86		
RURAL DISTRICTS																					
Bucklow ...	19890	22550	57651	.39	439	19.3	220	9.7		3		1	1	1	1	7	0.3	28	64	Yes. Hospital at Baguley.	Dr. T. W. H. Garstang.
Chester ...	10989	12302	35517	.34	269	21.8	113	9.9			2	2	1			5	0.7	19	72	Yes. Chester.	* Dr. A. G. Hamilton.
Congleton ...	12220	12220	40152	.30	304	24.87	154	12.6		6		2	7		2	17	1.3	30	98	Yes. West Heath Joint.	Dr. C. H. Wentworth-Bennett
Disley ...	2827	3180	2466	1.41	70	20.1	32	9.1				1				1	0.29	2	27	Yes. Hyde.	Dr. C. J. Bennett.
Macclesfield ...	15775	16943	79572	.21	269	15.87	149	8.79		3					1	4	.23	22	89	Yes. Macclesfield and Higher Sutton	Dr. C. C. Rushton.
Malpas ...	4488	4362	21406	.20	111	25.4	54	12.1								0		7	63	Yes. Chester. [for Small-pox.	* Dr. A. Leigh.
Nantwich ...	23197	24556	98466	.24	561	22.8	265	10.7	2	1	6	2		3		14	0.6	53	90	Yes. Nantwich Joint and Small-pox.	Dr. R. T. Turner.
Northwich ...	22073	24980	54310	.40	538	21.1	237	9.4	3	2	5		1			11	0.48	34	63	Yes. Northwich Joint and Leftwich.	Dr. H. E. Gough.
Runcorn ...	23244	25981	49159	.52	596	22.9	303	11.6			4	1	1	3		9	0.34	38	63	Yes. Dutton. Moore (Small-pox).	Dr. J. Adams.
Tarvin ...	12614	12584	56874	.22	313	24.8	130	10.3				1	2			3	0.24	20	64	Yes. Chester.	* Dr. T. Moreton.
Tintwistle ...	2105	2300	13021	.17	40	17.3	22	9.5				2				2	0.8	4	100	Yes. Mottram Moor.	Dr. G. J. Awburn.
Wirral ...	14017	17500	37594	.46	365	20.8	173	9.8		2	1	5	1		3	12	0.63	25	68	Yes. Wirral Joint.	Dr. J. B. Yeoman.
	163439	179762	546788	.32	3875	21.55	1852	10.30		19	10	26	15	5	10	85	.47	282	72		
Administrative County	593885	684878	64220	1.06	15273	22.30	8050	11.75	1	93	51	112	126	51	94	528	.77	1430	93		

† Exclusive of Workhouse and Prison.
* Now a Municipal Borough.

TABLE II.—MORTALITY.

Showing deaths from subjoined causes during the year ending December 31st, 1910, classified according to Diseases and Localities.

DISEASES	Small-pox.	Measles.	Scarlet Fever.	Whooping cough.	Diphtheria and Membranous Comp.	Croup.	Typhus Fever.	Euteric Fever.	Other Continued Fever.	Epidemic Influenza.	Diarrhoea.	Puerperal Fever.	Erysipelas.	Phthisis.	Other Tubercular Diseases.	Cancer, Malignant Disease.	Diseases of Respiratory Organs.	Alcoholism—Chlorosis of Liver.	Premature Birth.	Diseases and Accidents of Parturition.	Heart Diseases.
SANITARY DISTRICTS																					
Municipal Boroughs.																					
Congleton	..	1	1	2				2		1	3	1	2	10	7	13	24	1	13		18
Crewe		16	3	6	32			5		4	8	4		35	26	37	83	2	33	5	60
Dukinfield		3	4	11	3			8		4	4		1	17	15	20	58	2	11	3	26
Hyde	..	18	4	7	4			4		1	3	2	1	42	8	35	93	5	6	3	52
Macclesfield		4	5	3	3			2		2	2		1	40	12	29	63	8	14	2	71
Stalybridge			9	11	1			3			5			30	16	22	84	1	10	1	43
		41	26	39	45			24		12	25	7	5	17	84	156	405	19	87	14	270
Other Urban Districts.																					
Alderley Edge	...									...	1			3		1	2				3
Alsager	...			1										2	2	4	2		1		5
Altrincham		8		7	2					3	2	3		13	10	12	37	3	8	1	19
Ash-ton-upon-Mersey			1	2	4					...	2			3	2	9	12	1	4		6
Higher Bebington														3		3	1	1		1	4
Lower Bebington	1		1	4		1					4	3	1	7	4	8	13	2	9		10
Bollington														3	1	7	5		2	1	1
Bowdon														2		2	3				6
Bredbury and Romiley				3	1						1	1		6	6	9	23		2	2	10
Bromborough								2				1				1	1		2		1
Buglawton										1				2		6	2		1	1	5
Cheadle and Gatley				1						1				6	5	13	22	1	3	3	16
Compstall														3			1				1
Ellesmere Port and Whitby				1	1							1	2	11	3	5	16	2	5	2	10
Hale	1		1				1		1	2				6	1	9	8		2	1	4
Handforth																	1				1
Hazel Grove and Brainhall			1	3	3									2	4	9	16	2	2	1	20
Hollingworth											1			4	1	2	3	2			7
Hoole	2	1									1			2	3	5	9	2	1	1	7
Hoylake and West Kirby							2		1	3				11	7	12	25	1	1	2	11
Knutsford							4						1	5		1	7	1	7		9
Lymm				3	3					2	1			4	6	5	4	1	1		6
Marple			1	2					2	1				2	1	8	5	1	2	2	11
Middlewich	1				1									2	3	3	4	2	1	3	7
Mottram														2			1				5
Nantwich	1			2	3						2			4		4	14		4	1	11
Neston and Parkgate	1	1									2			5	2	5	5			1	7
Northwich	2			1	7	1				1	6		1	13	3	18	38	4	12	3	24
Runcorn	1	3	12	6			5			3	3	1		7	14	7	42		11	1	21
Sale			2	8	4		1				7			7	1	14	28	3	5	2	22
Sandbach														1	2	7	7		2		7
Tarporley				1										4	1		13		2		5
Wallasey	15	3	19	4			5		5	15	1	2	56	35	72	158	7	19	6	86	
Wilmslow	1									1				4	1	10	11		2	1	8
Winsford			1	1	1					1	6		2	3	6	11	21	3	9		22
Yeardeley-cum-Whaley														1	1	2	3				2
	1	33	15	72	41	2		20	2	21	59	11	10	209	125	285	568	39	120	36	408
Rural Districts																					
Bucklow	...	3		1	1	1		1		5	1	1		9	4	20	22	5	9	1	39
Chester	...		2	1	2					2		1		8	2	3	11		4		18
Congleton		6		7	2						2			7	6	11	22	2	3	2	19
Disley	...				1										2	1	2				9
Macclesfield		3								2	1	1	1	8	6	17	20	1	6	3	19
Malpas										2		1		2		7	9		1	2	15
Nantwich	...	2	1	2	6					6	3		2	12	4	21	35	1	12	1	24
Northwich	...	3	2		5		1		3				1	12	10	16	20	1	6	2	22
Runcorn			4	1	1		3							21	8	17	54	2	7	1	34
Tarvin				2	1					1				8	3	12	40		2		16
Tintwistle					2									2		1	4				4
Wirral		2	1	1	5					4	3			15	1	13	33	2	2		18
		19	10	15	26	1		5		25	10	4	4	104	46	139	252	14	52	12	237
Administrative County.																					
	1	93	51	126	112	3		49	2	58	94	22	19	487	255	580	1225	72	259	62	915

TABLE III.—INFECTIOUS DISEASE.

Showing cases notified and cases removed to Hospital during the year ending December 31st, 1910, classified according to Diseases and Localities, and giving particulars as to Isolation Hospital Provision.

SANITARY DISTRICTS.	Number of cases notified in each District.										Number cases removed to Hospital from each District.												Is Hospital Isolation provided?
	Small-pox.	Cholera.	Diphtheria including Membranous Group.	Erysipelas.	Scarlet Fever.	Typhus Fever.	Enteric Fever.	Continued Fever.	Puerperal Fever.	Phthisis.	TOTAL.	Small-pox.	Cholera.	Diphtheria including Membranous Group.	Erysipelas.	Scarlet Fever.	Typhus Fever.	Enteric Fever.	Relapsing Fever.	Continued Fever.	Puerperal Fever.	TOTAL.	
Municipal Boroughs.																							
Congleton			23	10	26		5		1		65			5		13		1				19	Yes. West Heath Joint.
Crewe			290	20	156		12		2	9	489			250	2	132		8			2	394	Yes.
Dukinfield			23	15	52		24				114			1								1	Yes. Hyde.
Hyde			8	39	32		15		3	15	112			3		23		11				37	Yes.
Macclesfield			16	16	284		15		4		335			10	3	214		8				235	Yes.
Stalybridge			9	10	76		18				113												Small-pox only, Joint Board's, Hartshead.
			369	110	626		89		10	24	1228			269	5	382		28			2	686	
Other Urban Districts																							
Alderley Edge				2	4						6					4						4	Yes. Bucklow Joint and Baguley.
Alsager				1	7						8					2						2	Yes. West Heath Joint.
Altrincham			13	4	24		2		3		46			1		24		2				27	Yes.
Ashton-upon-Mersey			9	6	48						63			2		16						18	Yes. Baguley
Higher Bebington			3	1	4						8			3		2						5	Yes. Wirral Joint.
Lower Bebington	16		14	10	49		1		2		93	15		14	5	47		1			2	84	Yes. Ditto.
Bollington					17						17					15						15	Yes. Macclesfield.
Bowdon			2		2						4												Yes. Baguley.
Bredbury and Romiley			4	7	11				4		25			1		4						5	Yes. Hyde.
Bromborough			5	5			3		1		14			4	2			2			1	9	Yes. Wirral Joint and Pool Works Village.
Baglawton					1		1				2												Yes. West Heath Joint.
Cheadle and Gatley			2	3	18				1		24				1	12						13	Yes. Baguley.
Compstall					2						2												Yes. Hyde.
Ellesmere Port and Whiteby			7	30	69				2		108			2	4	37					1	44	Yes. Wirral Joint.
Hale			8		8		1				17			6		5		1				12	Yes. Baguley and Monsall.
Haulforth					1						1												No.
Hazel Grove and Bramhall			7	2	11		3				23					5						5	Yes. Hyde.
Hollingworth					2						18												Yes. Small-pox only, Mottram Moor.
Hoole			10		81		1				92			4		11						15	Yes. Chester.
Hoylake and West Kirby			7	6	39		3				55			4		33		2				39	Yes. Wirral Joint.
Knutsford				2	21		37				60					20		23				43	Yes. Baguley.
Lymm			26	4	2						32												Yes. Ditto.
Marple				2	11				2		15					3						3	Yes. Hyde
Middlewich			8	6	20		2		4		40			5		14		1				20	Yes. Davenham and Marbury.
Mottram			2	3	7						12												Yes. Mottram Moor.
Nantwich			9	14	6				1		30			5		6						11	Yes. Alveston Joint.
Neston and Parkgate			14	1	3						18			9	1	2						12	Yes. Wirral Joint.
Northwich			53	18	28		9				108			10	7	8						25	Yes. Leftwich.
Runcorn			38	16	100		42	24	2		222						6					6	Yes. Runcorn.
Salce			12	8	113		1		1		135			1		29						30	Yes. Baguley and Monsall.
Sandbach			15	1	33		1				50			11		19						30	Yes. West Heath Joint, Arclid for Small-pox.
Tarporley			9		1						10			1		1						2	Yes. Chester.
Wallasey	7		44	32	329		14		4		430	7		25		229		12				273	Yes.
Wilmslow			2		16		1		1		20			1		13						14	Yes. Baguley and Monsall.
Winsford			8	14	55				1		78			2		24						26	Yes. Davenham and Marbury.
Yeardsley-cum-Whaley			2	1	8				1		12					3						3	Hyde and Hyde Peak.
	23		333	201	1165		1	121	24	30	1898	22		111	20	588		50			4	795	
Rural Districts.																							
Bucklow			14	8	94		6		1		123			8		75		3				86	Yes. Baguley.
Chester			21	2	59		2				84			10		14						24	Yes. Chester.
Congleton			61	7	54		1				123			29		20						49	Yes. West Heath Joint.
Disley			1	2	17						20												Yes. Hyde.
Macclesfield			13	6	61		1		1		82			3		27		1				31	Yes. Macclesfield and Greenway Higher Sutton for Small-pox.
Malpas			1		4						5												Yes. Chester.
Nantwich			65	11	94		2		1		173			35		38		1				74	Yes. Nantwich Joint.
Northwich			37	19	153		5		2		216			7		74		3				84	Yes. Small-pox Hospital separate.
Runcorn			23	19	186		4				232			6		100		1				107	Yes. Northwich Joint and Leftwich.
Tarvin			24	11	59		1				95			4		16						20	Yes. Dutton. Small-pox Hospital at Moore.
Tintwistle			2		10		1				13												Yes. Chester.
Wirral	1		18	4	67		2				92	1		17		56						74	Yes. Mottram Moor (Small-pox).
																							Yes. Wirral Joint.
	1		280	89	858		25		5		1258	1		119		420		9				549	
Administrative County	24		982	400	2649		1	235	24	45	24	4384	23		499	25	1390		87		6	2030	

